

Juelfs - 8th Science Syllabus –18-19

“Show me the evidence!”

Subject to sequential adjustment

What Science is and is not

Science or Engineering

Scientific experimentation, methodology, protocols, problem solving, procedures

Tools of the trade as they apply in the classroom including but not exclusively

Mathematical techniques

Measurement

Scientific Tools

General vocabulary introduction

Cause and effect

Evidence

Data collection and presentation

Benefits and consequences

Faulty interpretations

Much of the above will be incorporated into class experiences as appropriate rather than presented as freestanding material.

Note – Standards listed below apply to all topics shown within and below each of the four major units shown in bold type. They are not, for the most part, tagged to specific sections herein because, as a learned person once said, “nothing exists in isolation.”

Forces

8.PS2.1 Design and construct investigations depicting the relationship between magnetism and electricity in electromagnets, generators, and electrical motors emphasizing the factors that increase or diminish the electric current and the magnetic field strength.

8.PS2.2 Conduct an investigation to provide evidence that fields exist between objects even though the objects are not in contact.

8.PS2.3 Create an investigation of an object in motion and describe the position, force, and direction of the object.

8.PS2.4 Plan and conduct an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

8.PS2.5 Evaluate and interpret that for every force exerted on an object there is an equal force exerted in the opposite direction.

8.ETS1.1 Develop a model to generate data for ongoing testing and modification of an electromagnet, a generator, and a motor such that an optimal design can be achieved.

Describing Motion

Position applied to motion

The drt formula

Rates and acceleration including speed and velocity

The Laws of Motion

Newtonian Physics and more

Friction

Gravity and the forces of the universe

Newton's First law

Newton's Second Law

Newton's Third Law

Electricity

The language of electricity

Electrical charges and the forces thereof

Electrical current and simple circuits

Circuits – pieces and parts

Magnetism – Magnets and magnetic fields

Magnets and/to electrical currents

Electrical currents and/to magnets

Waves

8.PS4.1 Develop and use models to represent the basic properties of waves including frequency, amplitude, wavelength, and speed.

8.PS4.2 Compare and contrast mechanical waves and electromagnetic waves based on refraction, reflection, transmission, absorption, and their behavior through a vacuum and/or various media.

8.PS4.3 Evaluate the role that waves play in different communication systems.

Waves

Types of waves

Wave properties

Wave interactions

Sound (more waves) -

Producing and detecting

Interactions

Electromagnetic “Waves”

Electromagnetic radiation

The electromagnetic spectrum (Somewhere over the rainbow)

Electromagnetic “waves” are useful

Light (electromagnetic radiation)

Color, matter

Reflection and mirrors

Refraction and lenses

Optical technology

Our Universe

8.ESS1.1 Research, analyze, and communicate that the universe began with a period of rapid expansion using evidence from the motion of galaxies and composition of stars.

8.EES1.2 Explain the role of gravity in the formation of our sun and planets. Extend this explanation to address gravity's effect on the motion of celestial objects in our solar system and Earth's ocean tides.

8.ETS1.2 Research and communicate information to describe how data from technologies (telescopes, spectroscopes, satellites, and space probes) provide information about objects in the solar system and universe.

Our System – specifically our sun and moon

Earth's motion – relative to other bodies

Our moon and its “behavior”

Tides and Eclipses

Our Greater Solar System

Structure

Inner planets

That which never was or is no more

Dwarf planets and other cool stuff

To Infinity and Beyond

Earth's prospective

Our sun in consideration to other stars

Movement, growth and death of stars

Galaxies and the greater universe(s?)

Geology and Change

8.EES2.1 Analyze and interpret data to support the assertion that rapid or gradual geographic changes lead to drastic population changes and extinction events.

8.ESS2.2 Evaluate data collected from seismographs to create a model of Earth's structure.

8.EES2.3 Describe the relationship between the processes and force that create igneous, sedimentary, an metamorphic rocks.

8.EES2.4 Gather and evaluate evidence that energy from the earth's interior drives convection cycles within the asthenosphere which create change within the lithosphere including plate movements, plate boundaries, and sea-floor spreading.

8.EES2.5 Construct a scientific experiment using data that explains the gradual process of plate tectonics accounting for A) the distribution of fossils on different continents, B) the occurrence of earthquakes, C) continental and ocean floor features (including mountains, volcanoes, faults, an trenches).

8.ESS3.1 Interpret data to explain that earth's mineral, fossil, fuel, and groundwater resources are unevenly distributed as a result of geologic processes.

Rocks and the Rock Cycle

Igneous

Sedimentary

Metamorphic

Plate Tectonics

Historical hypothesis of Continental Drift

Development of understanding and mid-oceanic ridges

As we know this today – the boundary of plates

Consequences of plate tectonics

Earthquakes and volcanoes

8.EES3.2 Collect data, map, and describe patterns in the locations of earthquakes related to tectonic plate boundaries, interaction, and hotspots

And just where might this be?

Geologic Time

8.LS4.1 Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change in life forms throughout Earth's history.

8.LS4.2 Construct an explanation addressing similarities and difference of the anatomical structures and genetic information between extinct and extant organism using evidence of common ancestry and patterns between taxa.

8.LS4.3 Analyze evidence from geology, paleontology, and comparative anatomy to supports that scientific phenotypes within a population can increase the probabilities of survival of that species and lead to adaptation.

8.LS4.4 Develop a scientific explanation of how natural selection plays a role in determining the survival of a species in a changing environment.

8.LS4.5 Obtain, evaluate and communicate information about technologies that have changed the way humans use artificial selection to influence the inheritance of desired traits in other organisms.

Geologic history and the evolution of life

Paleozoic Era

Mesozoic Era

Cenozoic Era

Today-ish

The Environment and Change

Fossil evidence of evolution

Theory of evolution and natural selection

Biological evidence of evolution

Epilogue

*Tests, any projects completed outside the classroom, and many quizzes will be

announced in advance in the classroom and, for the most part, on “Remind.”

*Links to many resources available on website

*All standards available at www.tn.gov/education

