

**Jefferson County School (Jefferson Middle, Maury Middle, Rush Strong, White Pine)  
Course Syllabus**

**A. Course:** Sixth grade Earth Science

**B. Course Description:** Explores the foundations of Earth Science: Life Science, the relationships between Earth and Space, the basis of Physical Science, and Weather.

**C. Grade Term 2016/2017**

**D. Grading Scale**

<u>Range</u>	<u>Regular</u>
93-100	A
85-92	B
75-84	C
70-74	D

**E. Term Dates**

- a. 1<sup>st</sup> 9 Weeks August 5, 2016 – October 7, 2016
- b. 2<sup>nd</sup> 9 Weeks October 8, 2016 – December 16, 2016
- c. 3<sup>rd</sup> 9 Weeks January 5, 2017 – March 15, 2017
- d. 4<sup>th</sup> 9 Weeks March 16, 2017 – May 25, 2017

**F. Textbook(s)** Glencoe Tennessee Science 6<sup>th</sup> Grade

**G. Other Resources**

- a. Odysseyware
- b. Bill Nye
- c. Brain Pop
- d. MobyMax
- e. Read Works
- f. NewsELA

**H. Major Assignments**

- a. Science Fair Project (1<sup>st</sup> Semester)

**I. Procedures for Parental Access to Instructional Materials**

- a. Aspen Parent Portal
- b. Instructor's Website
- c. Email Instructor
- d. Parent Teacher Conference

- e. There are two designated conference dates during the school year. Parents who would like to request additional meetings may make appointments for conferences with the teachers (during their planning periods), counselors, or a principal by telephoning the school office.

**J. Standards, Objectives, & I can statements.**

**1<sup>st</sup> 9 Weeks**

1. **SPI 0607.Inq.1** Design a simple experimental procedure with an identified control and appropriate variables.  
-I can design and conduct an energy transformation investigation which demonstrates that some usable energy is lost as thermal energy, including: an identified independent variable, dependent variable, and control.
2. **SPI 0607.Inq.2** Select tools and procedures needed to conduct a moderately complex experiment.  
-I can identify and use appropriate lab tools/techniques to gather, and organize data from an investigation (balance, thermometer, creating and using data tables, graphing, etc....).
3. **SPI 0607.Inq.3** Interpret and translate data in a table, graph, or diagram.  
-I can analyze and interpret data in various forms, such as:
  - Forming a conclusion
  - Identifying cause and effect relationships
  - Determining if the data are sufficient to support a given claim
4. Identifying patterns/trends among the data  
**SPI0607.Inq.4** Draw a conclusion that establishes a cause and effect relationship supported by evidence.  
-I can communicate scientific understanding using models, descriptions, explanations or data in various forms (graphs, tables, charts).
5. **SPI 0607.Inq.5** Identify a faulty interpretation of data that is due to bias or experimental error.  
-I can review an experimental design or scientific literature to determine possible sources of bias or error, state alternative explanations and identify questions for further investigation.
6. **SPI 0607.T/E.1** Identify the tools and procedures needed to test the design features of a prototype.  
-I can identify tools and procedures needed to test the design features of prototype or solution.
7. **SPI 0607.T/E.2** Evaluate a protocol to determine if the engineering design process was successfully applied.  
-I can use the engineering design process to solve a given problem (the effect of invasive species on native populations) with multiple criteria/constraints or evaluate a protocol to determine if the engineering design process was successfully applied to solve a given problem.
8. **SPI 0607.T/E.3** Distinguish between the intended benefits and the unintended consequences of a new technology.  
-I can identify the intended benefits and unintended consequences of this new technology and describe its impact on society.

9. **SPI 0607.T/E.4** Differentiate between adaptive and assistive engineered products (e.g., food, biofuels, medicines, integrated pest management).  
-I can explain the difference between adaptive and assistive engineered products.
10. **SPI 0607.2.1** Classify organisms as producers, consumers, scavengers, or decomposers according to their role in a food chain or food web.  
-I can differentiate between renewable and nonrenewable energy resources by asking questions about their availability and sustainability.  
-I can model a food web.  
-I can describe the role of producers, consumers, scavengers, and decomposers in an ecosystem.
11. **SPI 0607.2.2** Interpret how materials and energy are transferred through an ecosystem.  
-I can diagram and describe the flow of matter and energy through the biotic and abiotic components of an ecosystem, using the terms producers, consumers (primary, secondary, tertiary) and decomposers.  
-I can evaluate the impact of an increase or decrease of an abiotic component of an ecosystem.  
-I can evaluate the impact of an increase or loss of a species on a food web.  
-I can model an energy pyramid.  
-I can identify two factors that define a biome: climate and latitude.
12. **SPI 0607.2.3** Identify the biotic and abiotic elements of the major biomes.  
-I can compare and contrast the biotic and abiotic elements of each major biome.  
-I can interpret a climatogram of a biome.  
-I can examine and model interactions between the abiotic and biotic elements of a given biome.  
-I can model and explain levels of ecological organization: organism, population, community, ecosystem, biome and biosphere.
13. **SPI 0607.2.4** Identify the environmental conditions and interdependencies among organisms found in the major biomes.  
-I can reason scientifically why plants and animals have certain adaptations for survival within their biome.  
-I can compare and contrast the world's major biomes in terms of the adaptations of plants and animals living there.  
-I can analyze data concerning predator/prey relationships.  
-I can explain the importance of prey adaptations such as mimicry, camouflage, chemical defenses, and predator adaptations such as eye placement, speed and physical attributes.  
-I can explain and give examples of symbiotic relationships between species living in the same community such as: mutualism, parasitism and commensalism.  
-I can analyze evidence about the effect of an invasive species on native populations, and design a solution to lessen its impact on native species  
-I can research and explain using data, the following biomes:
- Desert

- Savannah
- Temperate Grassland
- Deciduous Forest
- Coniferous Forest
- Tropical Rain Forest
- Tundra
- Ocean
- Freshwater (rivers, lakes, streams & ponds)

## 2<sup>nd</sup> 9 Weeks

1. **SPI 0607.6.1** Use data to draw conclusions about the major components of the universe.  
-I can identify a component of the universe given data such as its composition, size and motion.
  - Inner terrestrial planets
  - Outer gaseous planets
  - Asteroids
  - Meteors/Meteoroids/Meteorites
  - Comets
  - Satellites (Man-Made and Natural)
  - Stars
  - Solar Systems (Planetary Systems)
  - Galaxies
2. **SPI 0607.6.2** Explain how the relative distance of objects from the earth affects how they appear.  
-I can order these components of the Universe by distance from the Earth:
  - Moon, Sun, other planets, asteroids, comets, stars, other solar systems and galaxies.
  - Astronomical Unit (AU)
  - Light Year
 -I can create a scale model of the solar system converting AU to a useable unit of measurement.  
-I can explain why all the stars do not have the same appearance.
  - Apparent magnitude
  - Absolute magnitude
 -I can interpret graphs to infer and draw conclusions, such as the HR (Hertzprung-Russell) diagram.
3. **SPI 0607.6.3** Distinguish among a day, lunar cycle, and year based on the movements of the earth, sun, and moon.  
I can explain the processes of rotation and revolution of the Earth and Moon around the Sun.
  - Rotation (Period of Rotation/year)
  - Revolution (Period of Revolution/day)
  - Orbit
  - Lunar Cycle(Origination of the Month/Calendar)
4. **SPI 0607.6.4** Explain the different phases of the moon using a model of the earth, moon,

and sun.

-I can model the positions of the Sun and Earth, in order to communicate why we have seasons on Earth.

- Seasons duration
- Solstices/Equinoxes—beginning of each season
- Solar Angle (Direct/Indirect Light-Beam Spreading)
- North Star (Polaris)
- Tilt of Axis (23.5 degrees) is one cause for seasons
- Northern and Southern Hemispheres—have opposite seasons
- Rotation / revolution
- Counterclockwise

5. **SPI 0607.6.5** Predict the types of tides that occur when the earth and moon occupy various positions.

-I can model and explain the phases of the Moon in a Lunar Cycle.

- 8 Phases
- Waning/Waxing
- View from Earth
- View from Space

6. **SPI 0607.6.6** Use a diagram that shows the positions of the earth and sun to explain the four seasons

-I can model the positions of the Sun and Earth, in order to communicate why we have seasons on Earth.

- Seasons duration
- Solstices/Equinoxes—beginning of each season
- Solar Angle (Direct/Indirect Light-Beam Spreading)
- North Star (Polaris)
- Tilt of Axis (23.5 degrees) is one cause for seasons
- Northern and Southern Hemispheres—have opposite seasons
- Rotation / revolution
- Counterclockwise

7. **SPI 0607.6.7** Explain the difference between a solar and a lunar eclipse.

-I can model and diagram the relationship between the Earth, Sun and Moon during High Tide and Low Tide.

- Neap/Spring Tides
- Tidal Range
- Daily Tides

I can model and explain the relationship between the Earth, Sun and Moon during Solar and Lunar eclipses.

### **3<sup>rd</sup> 9 Weeks**

1. **SPI 0607.10.1** Distinguish among gravitational potential energy, elastic potential energy,

and chemical potential energy.

-I can distinguish between three forms of potential energy through hands on investigations.

- Chemical potential energy
- Gravitational potential energy
- Elastic potential energy

2. **SPI 0607.10.2** Interpret the relationship between potential and kinetic energy.

-I can interpret the relationship between potential energy and kinetic energy.

- Potential energy
- Kinetic energy
- Mechanical energy

3. **SPI 0607.10.3** Recognize that energy can be transformed from one type to another.

-I can identify and model examples of energy transformations that occur in everyday life involving different forms of potential and kinetic energies.

- Radiant Energy
- Electrical Energy
- Sound Energy
- Light Energy
- Nuclear Energy
- Chemical Energy
- Thermal energy

-I can differentiate between renewable and nonrenewable energy resources by asking questions about their availability and sustainability.

4. **SPI 0607.10.4** Explain the Law of Conservation of Energy using data from a variety of energy transformations.

-I can explain the Law of Conservation of Energy using data from a variety of energy transformations.

5. **SPI 0607.12.1** Identify how simple circuits are associated with the transfer of electrical energy when heat, light, sound, and chemical changes are produced.

-I can build a simple circuit given wires, batteries, buzzers and bulbs.

- Open Circuit
- Closed Circuit
- Load
- Energy Source

-I can describe the energy transformations that are associated with a simple circuit such as:

- Electrical
- Mechanical
- Light
- Sound
- Chemical

6. **SPI 0607.12.2** Identify materials that can conduct electricity.

-I can design, write scientific procedures and perform investigations to

compare and contrast the characteristics of electrical conductors and electrical insulators.

- Insulator
- Conductor

7. **SPI 0607.8.1** Analyze data to identify events associated with heat convection in the atmosphere.

-I can identify and use meteorological tools to gather data.

- Thermometer
- Barometer
- Anemometer
- Psychrometer/hygrometer
- Wind vane/compass

-I can produce and analyze graphical analyses of collected weather data.

-I can explain how the process of convection relies on conduction and radiation that produce air movements in the atmosphere.

- Density (  $D = m/v$  ) measured in g/cc
- Convection/Convection Cell
- Radiation
- Conduction
- Heat transfer
- Energy transfer
- Seasons (Introduced)

8. **SPI 0607.8.2** Recognize the connection between the sun's energy and the wind.

-I can describe how the sun's energy produces the wind on Earth due to uneven heating of Earth's surface.

-I can link sunlight to the flow of heat and the convection cycle in the atmosphere.

-I can model a convection cell: a cyclical pattern of air particles that change position within the cell due to temperature and density changes.

-I can determine the textual meaning and apply the following concepts as they relate to wind.

- Coriolis Effect (based on Earth's rotation and pressure changes)
- Prevailing Wind Direction
- Global Winds
- Local Winds: Land/Sea Breezes, Mountain/valley Breezes

-I can research and discuss how mountain ranges, bodies of water, and other geographical features cause climate variations.

9. **SPI 0607.8.3** Describe how temperature differences in the ocean account for currents.

-I can identify the sun as the major source of energy for ocean currents.

-I can examine the "Global Ocean Conveyor" (thermohaline circulation) that yields surface and deep currents due to density, salt content and temperature.

-I can explain that the global movement of water is affected by the transfer of energy and variations in salt concentrations.

-I can model and explain that the circular motion of convection cells is

based on density (less/more dense), temperature (warmer/cooler), particle motion (fast/slow movement) and salinity (less salt/more salt).

10. **SPI 0607.8.4** Interpret meteorological data to make predictions about the weather.

-I can interpret data found on ocean current maps and make predictions about weather events.

-I can explain how wind and ocean currents (surface and deep) affect weather and climate along coastal regions.

- California current
- Gulf stream

-I can model how air moves, due to land and water heating at different rates

-I can determine the textual meaning of and explain the following:

- Severe weather (tornado/Hurricane)
- Air Masses (Cold/Warm)
- Weather Fronts
- Water Cycle
- High and Low Pressure Systems

-I can evaluate tools and technologies (seismic monitors, tiltmeters, spectrometer, radar mapping, etc...) designed to predict and minimize the effects of severe weather and other natural disasters such as volcanoes or earthquakes.