Diocese of Fall River Grades 6-8 Science Learning Outcomes: These learning outcomes are organized into 3 sections: Earth & Space Science, Life Science and Physical Science. A school's curriculum may address each section in a separate year, or it may include parts of each for the 3 years. In addition to achieving these standards, a student is expected to have developed the skills necessary to do science, i.e. scientific inquiry, including designing and conducting experiments, and to have been given the opportunity to experience Technology/Engineering challenges.

[The Diocesan Science Curriculum Guidelines and Preface are available at: www.dfrcec.com]

EARTH & SPACE SCIENCE
1. Construct and interpret various 2- and 3-dimensional models of the earth's common physical features, including contour maps.
2. Describe the layers of the solid earth as the lithosphere; the hot, convecting mantle; and the dense, metallic core.
3. Describe how the movement of the earth's crustal plates causes major geological events (e.g. earthquakes, volcanic eruptions and the formation of mountains and ocean basins.)
4. Explain how landforms are the result of both constructive and destructive forces.
5. Explain the relationship among the energy provided by the sun, the global patterns of atmospheric movement, and the temperature differences among water, land, and atmosphere.
6. Define & explain how radiation, conduction and convection are the mechanisms to transfer heat in the earth's systems.
7. Describe how processes we can still see today, such as erosion, movement of lithospheric plates, and changes in atmospheric composition, have caused changes to the earth over geologic time.
8. Explain and give examples of how physical evidence, including fossils, demonstrates that the earth has evolved over time.
9. Predict possible effects of a catastrophic event such as the impact of an asteroid or comet on the earth's geology and/or ecology.
10. Describe gravity as a force that pulls all things on or near the surface toward the center.
11. Briefly explain the relationship between differences in gravity on the moon and/or various planets and an object's weight
12. Explain the role of gravity on the formation of the solar system and the movements of its components.
13. Explain how gravity and the relative positions of the sun, moon and earth cause ocean tides
14. Explain how the relative positions of the earth, moon, and sun cause lunar and solar eclipses
LIFE SCIENCE
[Additional outcomes from the Diocesan Health Curriculum Guidelines will also be included unless they are addressed in other courses.]
1. Explain the development of the Cell Theory emphasizing how the body of science builds over time.
2. Describe the interrelationship between science and technology through the study of the evolution of the microscope and/or other technologies.
3. Create and interpret diagrams or models of plant and animal cells, identifying the major organelles and the function of each (nucleus, cytoplasm, cell membrane, cell wall.)
4. Arrange and give examples of the five levels of organization within a multicellular organism (cell, tissue, organ, system, organism).
5. Classify living organisms by similarities in structure according to the currently accepted classification system.
6. Describe the relationship between cellular respiration and photosynthesis.
7. Illustrate how producers, consumers and decomposers interact with each other to cause energy, beginning with sunlight via photosynthesis, to be transferred through a food web.
8. Analyze the interrelationships between organisms including competitive, mutually beneficial, predator-prey and parasite/host relationships.
continued
9. Predict how populations respond to changes in conditions and/or interactions among organisms

(including the actions of humans).
10. Relate genetic variation to a species' survival.
11. Explain the theory of evolution using data from the fossil record and other evidence.
12. Recognize the structure, function and replication of DNA.
13. Explain the fundamental connections among heredity, DNA, genes, and chromosomes.
14. Design an investigation to study genetic variation within the classroom population (such as tongue rolling, attached earlobes, etc.)
15. Construct a family tree (of actual or hypothetical people) to demonstrate the inheritance of a specific trait.
16. Explain the differences between sexual and asexual reproduction.
17. Debate some of the pros and cons of genetically engineered food.
18. Describe the history of genetics.
19. Describe the difference between innate and learned behavior.
20. Explain, using examples, how behavioral changes help organisms survive changes in the environment.
21. Link behavioral changes to evolutionary adaptations
22. Analyze the advantages and disadvantages of social behaviors.
23. Give examples of how organisms maintain internal conditions while being exposed to changing external environments (maintain homeostasis.)
24. List and give the function of the different human body systems.
25. Explain the importance of interactions between systems.
26. Relate diseases to the malfunction of organ systems.
27. Explain the importance of a healthy lifestyle to the prevention of disease. (topics could include exercise, nutrition, drugs/alcohol, environmental health.)
PHYSICAL SCIENCE
1. Use appropriate equipment to measure mass, volume, distance and temperature using the metric system.
2. Differentiate between mass and weight.
3. Define and calculate density using appropriate units.
4. Use the physical properties of a given substance to distinguish it from others
5. Differentiate between elements, compounds and mixtures.
6. Given the Periodic Table, briefly describe how it is arranged and read basic information about atoms/elements from it.
7. Recognize that all substances consist of one or more of the 100+ known elements.
8. Compare and contrast physical and chemical changes.
9. Explain the conservation of mass in chemical reactions (for example, when an Alka-seltzer dissolves and the gas is collected.)
10. Describe the forces acting on an object in motion and one at rest.
11. Explain inertia.
12. State Newton's Laws of motion and give examples.
13. Describe an object's motion in terms of its position, direction and speed.
14. Predict how a change in at least one of the forces acting on an object will affect its motion.
15. Assemble simple machines and explain the relationship between the distance an object moves and the force needed to move it.
16. Construct and interpret graphs of distance vs. time.
17. Give examples of the change of energy from one form to another (for example: heat to light, electricity, mechanical motion, sound, nuclei, and chemical.)
18. Describe situations where kinetic energy is transformed into potential energy and vice versa.
19. Explain what happens to particles during a phase change.
20. Predict how heat will move by conduction, convection and/or radiation until equilibrium is reached and relate this to temperature