

**Diocese of Fall River Grades PreK-K Science Learning Outcomes:** Science instruction will most often be integrated with other subjects, for example, learning to distinguish between living and non-living things (#1 & #2) while reading various stories. Art projects include the use of tools (like scissors) and the differences among materials. These activities along with the use of various manipulatives contribute to achieving age-appropriate technology/engineering standards. Emphasis is placed on encouraging children’s natural curiosity while developing their scientific inquiry skills such as making observations and sharing them with others, asking questions, and finding patterns.  
 [The Diocesan Science Curriculum Guidelines and Preface are available at: [www.dfrcec.com](http://www.dfrcec.com)]

<i>[Additional outcomes from the Diocesan Health Curriculum Guidelines may also be included.]</i>
The student can (in words and/or pictures):
1. Identify things as living or nonliving
2. Discuss the differences between living and nonliving things
3. Identify different kinds of living things (such as humans, mammals, birds, fish, reptiles, insects, plants) & group like things together
4. State the basic survival needs of plants: such as water, soil, sunlight
5. Name the basic survival needs of animals: food, water, shelter
6. Observe and describe how plants grow and change, especially over seasons
7. Observe and describe how animals grow and change
8. Name and illustrate the 4 seasons
9. Examine & sort objects with similar and/or different properties, such as by their size, color, shape, weight, texture.
10. Sort objects or materials according to their state of matter (liquid, solid, gas).
11. Discuss the different ways objects can move: in a straight line, back and forth, in a circular motion, up and down, fast or slow.
12. Demonstrate how the motion of an object can be changed by applying a force such as push or pull, for example, giving a ball a gentle push versus a hard push

**Diocese of Fall River Grades 1-2 Science Learning Outcomes:** A school's curriculum will address these outcomes over this 2 year span. Science instruction will most often be integrated with other subjects, for example, learning about the characteristics of groups of living things (#11) while reading various books about animals. Art projects include the use of tools (like scissors) and the differences among materials. These activities along with the use of various manipulatives contribute to achieving age-appropriate technology/engineering standards. Emphasis is placed on encouraging children's natural curiosity while developing their scientific inquiry skills such as making observations and sharing them with others, asking questions, and finding patterns.

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<i>[Additional outcomes from the Diocesan Health Curriculum Guidelines may also be included.]</i>
The student can (in words and/or in pictures):
1. Describe the sun as a source of heat and light and as necessary for living things
2. Demonstrate/illustrate that light can pass through some objects and is blocked by others causing a shadow
3. Describe the effects of the sun's light on objects such as warming, color change/fading, melting
4. Describe the weather (including temperature, wind and precipitation.)
5. Describe/illustrate how the weather changes from day to day and from one season to the next.
6. Describe the earth's surface as including rocks, soil, water and living things.
7. Recognize the repeating patterns of day/night, the seasons and the 4 major phases of the moon.
8. Describe/illustrate all living things as growing, reproducing and needing food, air and water.
9. List ways that an organism's habitat meets its basic needs.
10. Describe/illustrate changes in a living thing during its life cycle.
11. Identify the characteristics that living things grouped together share (for example, fur-mammals, birds-feathers, scales-fish)
12. Compare how many living things closely resemble their parents
13. Identify things that help plants and animals live in their environment such as using their senses and/or having special characteristics.
14. Describe some of the changes plants and animals go through as the seasons change
15. Recognize fossils as the remains of living things that can tell us about the earth in the past
16. Predict how an object's motion will change if a force is applied
17. Distinguish between the 3 states of matter and describe a solid as having a definite shape, and liquids and gases as taking the shape of their containers
18. Use basic tools including a ruler, thermometer, magnifier and balance (commercial or self-made)

**Diocese of Fall River Grades 3-5 Science Learning Outcomes:** A school's curriculum will address these outcomes over this 3 year span. In addition to achieving these standards, a student is expected to have developed the grade-level-appropriate skills necessary to do science, i.e. scientific inquiry, including asking and answering questions by conducting investigations or 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](http://www.dfrcec.com)]

<i>[Additional outcomes from the Diocesan Health Curriculum Guidelines will also be included unless they are addressed in other courses.]</i>
1. Sort into the major groups, based on their physical characteristics: plants (flowering vs. non-flowering) and animals (mammal / bird / fish / reptile / insect )
2. Use a key to sort organisms into their major group.
3. Identify the basic structures of plants (roots, stem, leaves,) the major functions of each, and how plants grow.
4. Recognize that all living things have a predictable life cycle that may or may not include dramatic changes in form.
5. Give examples of inherited characteristics
6. Describe how the needs of an organism must be met by its environment in order for it to survive.
7. Describe how plants and animals respond to changes in their environment.
8. Give examples of how organisms can change their environments and/or impact their ecosystems.
9. Distinguish between learned and instinctive behaviors
10. Describe how the sun's energy is used by plants [to produce sugars (via photosynthesis) and is transferred within a food chain.]
11. Recognize that matter has many observable properties, such as weight, shape, color, temperature; and that these properties can be measured and/or used to sort things.
12. Compare and contrast the basic properties of solids, liquids and gases [definite shape or not, takes up certain amount of space or not.]
13. Describe how water can change from one state to another
14. Identify the basic forms of energy (light, sound, heat, electrical, magnetic)
15. Give examples of how one form of energy can be changed to another form
16. Construct an electrical circuit using a battery with a light bulb or bell and explain the requirements for a working circuit.
17. Test materials and determine if they are conductors or insulators
18. Construct and use an electromagnet
19. Recognize that magnets have poles that attract or repel each other.
20. Test materials and formulate conclusions about what type(s) of materials are magnetic
21. Recognize that sound is produced by vibrating objects and requires a medium through which to travel. Relate the rate of vibration to the pitch of the sound.
22. Recognize that light travels in a straight line until it strikes an object or travels from one medium to another, and that light can be reflected, refracted, or absorbed.
23. Categorize minerals based on their physical properties
24. Distinguish between the 3 categories of rocks (igneous, metamorphic & sedimentary.)
25. Explain what soil is and how it is formed.
26. Describe the weather in terms of measurable quantities such as air temperature, wind speed and direction, and precipitation.
27. Describe how global patterns such as the jet stream and water currents influence local weather.
28. Differentiate between weather and climate.
29. Describe/illustrate the water cycle.
30. Give examples of how the surface of the earth changes by such processes as erosion and weathering; landslides, volcanoes and earthquakes.
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31. Describe the solar system in the most basic terms.

32. Describe the movements of the earth and relate its rotation to day/night and the apparent movement of objects in the sky.

33. Describe the changes in the observable shape of the moon over the course of a month.

34. Use basic tools with increasing accuracy & precision (including a ruler, thermometer and balance) to make metric measurements.

**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.

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### **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.

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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.)
<b>PHYSICAL SCIENCE</b>
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