

HADDONFIELD PUBLIC SCHOOLS  
Curriculum Map for 7<sup>th</sup> grade Science

*SEPTEMBER*

**Targeted Standard(s): NJCCCS**

**5.1.8 A 2.** Habits of Mind – communicate with others

**5.1.8 A 4.** Habits of Mind – curiosity, skepticism, honesty, open-mindedness

**5.1.8 C 1.** Safety – when & how to use safety equipment

**Enduring Understandings:**

Because of today's technology, world events, and politics, it is important for all citizens to be scientifically literate.

Scientists use a variety of tools to make their jobs easier or more accurate.

Science is a field that is always changing.

**5.1 A&B**

Scientific inquiry involves asking scientifically-oriented questions, collecting evidence, forming explanations, connecting explanations to scientific knowledge and theory, and communicating and justifying explanations.

**5.1 C** Safety first!

**Essential Questions:**

What are teacher and student expectations/requirements?

Why is science important, and why is it always changing?

How do you distinguish between observation and inference?

Why are microscopes used?

What is Current Science?

**5.1. A**

What constitutes evidence?

When do you know you have enough and the right kind of evidence?

How can this result be best justified and explained to others?

**5.1 B**

What makes a question scientific?

**5.1 C**

What does Safety First demand of us in each setting?

What rules are general and what are situation-specific?

HADDONFIELD PUBLIC SCHOOLS  
Curriculum Map for 7<sup>th</sup> grade Science

| Core Content/Objectives  |  | Instructional Actions   |   |
|--|--|---|---|
| Concepts<br><i>What students will know</i>   | Skills<br><i>What students will be able to do</i>  | Activities/Strategies<br><i>Learning Activities/ Differentiation<br/>Interdisciplinary Connections</i>  | Assessment<br><i>How learning will be assessed</i>  |
| <ul style="list-style-type: none"> <li>Classroom expectations/rules</li> <li>Safety in the lab</li> <li>Definitions and samples of observation and inferences.</li> <li>Facts vs. Theories- definitions and samples</li> <li>Microscope review of parts and usage</li> <li>Lab expectations/ scientific method: to include: posing questions, developing hypothesis, designing an experiment or following procedures, interpreting data, drawing conclusions. (Throughout the year)</li> <li>Current Science Expectations</li> <li>Skills for thinking critically</li> </ul> | <ul style="list-style-type: none"> <li>Identify rules; make a list of rules and expectations.</li> <li>Be able to locate and use safety equipment</li> <li>Use context clues to understand the differences between inference/observation and fact/theory</li> <li>Apply personal knowledge to situations</li> <li>Use and identify parts of the microscope to focus properly</li> <li>Locating current science articles in periodicals, newspapers, or online</li> <li>Measuring accurately</li> </ul> | <p>Scavenger hunt for equipment to learn locations</p> <ul style="list-style-type: none"> <li>Group and classroom discussion</li> <li>Carousel activity</li> <li>Do Now's (activities to get the discussions started, usually a question that the students answer independently, then share answers in a small group, and then share with the teacher)</li> <li>Microscopes: functions, parts and practice</li> <li>Using technology and other resources beyond the classroom to read and summarize current science issues</li> <li>Video: Microscopes</li> <li>Observations &amp; Inferences Activity</li> <li>Lab Equipment Introduction</li> <li>Metric measurement usage</li> <li>Thinking critically activity</li> </ul> | <ul style="list-style-type: none"> <li>Quiz on safety rules (All quizzes/tests may include a variety of ways of assessment such as: multiple choice, fill in the blank, true/false, labeling, defining, short answer, interpreting charts, and matching)</li> <li>Quiz on microscope parts</li> <li><u>Lab</u>: All labs must have the following parts: title, purpose, materials, procedures, data, conclusion, application, and illustrations. This is in a report format. It will be the same throughout the year.</li> <li><u>Current Science</u>: Will be due every Monday throughout the year.</li> </ul> |
| <p>Resources/Technology:<br/>LCD Projector<br/>United Streaming videos &amp; other websites for models<br/>Excel for data collection</p>   |  |   |   |

HADDONFIELD PUBLIC SCHOOLS  
Curriculum Map for 7<sup>th</sup> grade Science

| <i>October</i>   |   |  |   |
|--|---|--|---|
| <b>Targeted Standard(s): NJCCCS</b><br>5.5.8 A 2. Matter, Energy & Organization in Living Systems - levels of organization<br>5.5.8 B 1. Diversity & Biological Evolution – compare orgs. by internal & external charc.  |   |  |   |
| <b>Enduring Understandings:</b><br><ul style="list-style-type: none"> <li>▪ In order to be considered alive, there are certain characteristics something must possess.</li> <li>▪ All organisms need certain basic conditions to survive.</li> <li>▪ Science is based on evidence, and is always changing or reinforced based on new discoveries.</li> <li>▪ Scientists must use instruments and inferences to make judgments about what cannot be seen.</li> </ul> <b>5.5 B</b><br>Organisms are grouped in taxonomy based upon similarity. |   |  |   |
| <b>Essential Questions:</b><br>What is a controlled experiment?  |   |  |   |
| Core Content/Objectives  |   | Instructional Actions  |   |
| Concepts<br><i>What students will know</i>   | Skills<br><i>What students will be able to do</i>                             | Activities/Strategies<br><i>Learning Activities/ Differentiation<br/>Interdisciplinary Connections</i>   | Assessment<br><i>How learning will be assessed</i>  |
| <ul style="list-style-type: none"> <li>• Define what an controlled experiment is; including variable, manipulated variable, responding variable</li> <li>• The 6 characteristics of living things are: respond to stimuli, use energy, grow &amp; develop, cellular organization, have similar chemicals, and reproduce.</li> <li>• All living things need: sun (heat energy), water, air, stable internal conditions, nutrients (food energy), and living space.</li> <li>• Redi and Pasteur conducted</li> </ul>                           | <ul style="list-style-type: none"> <li>• Use a compound microscope</li> </ul> | <ul style="list-style-type: none"> <li>• Group and classroom discussion</li> <li>• Do Now's</li> <li>• Using graphs and charts</li> <li>• Redi &amp; Pasteur activity</li> <li>• Is it alive?</li> </ul> | <ul style="list-style-type: none"> <li>• Quiz on Classification</li> <li>• Hands-on quiz demonstrating use of the microscope.</li> <li>• All tests are composed of multiple choice, true and false, completion, interpreting visuals, and short answer or essay questions and are worth at least twice as many points as a quiz.</li> </ul> |

HADDONFIELD PUBLIC SCHOOLS  
Curriculum Map for 7<sup>th</sup> grade Science

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| <p>experiments that support the theory that life comes from life. These experiments are able to be repeated.</p> <ul style="list-style-type: none"> <li>• According to Urey &amp; Miller's experiment, organic chemicals may have combined to form the first life forms, which were heterotrophs.</li> <li>• Autotrophs make their own food, heterotrophs must obtain it from an outside source.</li> <li>• Scientific names are based in Latin because it was formerly the universal language, but the names are still appropriate.</li> </ul> |  |  |  |
| <p>Resources/Technology:<br/>LCD Projector<br/>United Streaming videos &amp; other websites for models<br/>Excel for data collection</p>  |  |  |  |

HADDONFIELD PUBLIC SCHOOLS  
Curriculum Map for 7<sup>th</sup> grade Science

| <i>November</i>  |   |  |   |
|--|---|--|---|
| Targeted Standard(s): NJCCCS   |   |  |   |
| Enduring Understandings:   |   |  |   |
| Essential Questions:<br>How does life continue?<br>What is a cell?<br>What is the cell theory?<br>What makes up a cell and what are there functions?<br>How are substances moved into and out of cells?<br>What is an analogy?   |   |  |   |
| Core Content/Objectives  |   | Instructional Actions  |   |
| Concepts<br><i>What students will know</i>   | Skills<br><i>What students will be able to do</i>   | Activities/Strategies<br><i>Learning Activities/ Differentiation<br/>Interdisciplinary Connections</i>   | Assessment<br><i>How learning will be assessed</i>  |
| <ul style="list-style-type: none"> <li>• Introduction to cells characteristics: cell membrane, cytoplasm, and nucleus.</li> <li>• Distinguish between animal and plant cells.</li> <li>• Identify parts of both animal and plant cells and there functions</li> <li>• Scientists: Hooke, Schwann, Leewenhoek and Schleiden</li> <li>• Explain diffusion, osmosis, and active transport.</li> <li>• State the three points of the cell theory</li> <li>• Explain the concept of an analogy</li> <li>• Book: Science Explorer: Cells and Heredity</li> </ul> | <ul style="list-style-type: none"> <li>• Identify parts and functions of both plant and animal cells.</li> <li>• Use Venn diagrams to determine similarities and differences between cells.</li> <li>• Use analogies to explain the function of the cell as a whole</li> <li>• Explain concepts of diffusion, osmosis, and active transport</li> <li>• State the three points of the cell theory</li> <li>• Explain how the cell parts/functions can be compare to everyday occurrences through the use of analogies</li> </ul> | <ul style="list-style-type: none"> <li>• Tri-folds: take a folded paper and pick nine parts of the cell to examine further.</li> <li>• Carousel</li> <li>• Jigsaw: using their tri-folds</li> <li>• Smart Board – interactive cells parts</li> <li>• Lab: Cell Membrane/Diffusion using a chicken egg</li> <li>• Group activity using various analogies to explain the functions of the cell parts</li> <li>• Do Now's</li> <li>• Video: Cell parts and functions</li> </ul> | <ul style="list-style-type: none"> <li>• Lab report on Diffusion</li> <li>• Quiz on cell parts</li> <li>• Quiz on cell functions</li> <li>• Test on chapter 1; Cells and Heredity Book</li> </ul> |
| Resources/Technology:  |   |  |   |

HADDONFIELD PUBLIC SCHOOLS  
Curriculum Map for 7<sup>th</sup> grade Science

| <i>December</i>   |  |   |  |
|---|--|---|--|
| Targeted Standard(s): NJCCCS  |  |   |  |
| Enduring Understandings ( <i>The big ideas</i> ):   |  |   |  |
| Essential Questions: <ul style="list-style-type: none"> <li>• How do living things get and use energy?</li> <li>• What does the study of chemistry and the periodic table have to do with photosynthesis?</li> <li>• What happens during the process of photosynthesis?</li> <li>• What is cell division?</li> <li>• What events take place during the three stages of the cell cycle?</li> <li>• What is DNA? (briefly)</li> </ul> |  |   |  |
| Core Content/Objectives   |  | Instructional Actions   |  |
| Concepts<br><i>What students will know</i>  | Skills<br><i>What students will be able to do</i>  | Activities/Strategies<br><i>Learning Activities/ Differentiation<br/>Interdisciplinary Connections</i>  | Assessment<br><i>How learning will be assessed</i>   |
| <ul style="list-style-type: none"> <li>• Photosynthesis and respiration</li> <li>• Cell Cycle: Mitosis</li> <li>• The stages of mitosis: be able to identify the 3 stages and 4 parts</li> </ul> Introduce meiosis and heredity including the concept of DNA briefly  | <ul style="list-style-type: none"> <li>• Identify chemistry integration with the chemical equation of photosynthesis and respiration</li> <li>• Identify the cyclical nature of photosynthesis and respiration</li> <li>• Explain how the sun supplies all living things with the energy they need</li> <li>• Describe the process of photosynthesis</li> <li>• List the events that take place during the three stages of the cell cycle</li> <li>• Identify each of the stages of the cell cycle including the phases of mitosis</li> <li>• Briefly identify meiosis</li> <li>• Describe the structure of DNA and how DNA</li> </ul> | <ul style="list-style-type: none"> <li>• Photosynthesis molecular formula using white boards</li> <li>• Microscopes: identifying the cell cycle with slides of an Onion Root Tip going through the stages and phases of mitosis</li> <li>• Video: Mitosis</li> <li>• Lab: Stomata</li> <li>• Multiply while dividing activity on mitosis</li> <li>• Book: Prentice Hall Science Explorer: Cells and Heredity</li> <li>• DNA ladder</li> <li>• Do Now's</li> </ul> | <ul style="list-style-type: none"> <li>• Quiz: Chapter 3 of Cells and Heredity Book</li> <li>• Lab: Stomata</li> <li>• Test Chapter 3</li> </ul> |

HADDONFIELD PUBLIC SCHOOLS  
Curriculum Map for 7<sup>th</sup> grade Science

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|                       | replication occurs (very briefly) |  |  |
| Resources/Technology: |                                   |  |  |

HADDONFIELD PUBLIC SCHOOLS  
Curriculum Map for 7<sup>th</sup> grade Science

| <i>January</i>   |   |  |  |
|--|---|--|--|
| Targeted Standard(s): NJCCCS   |   |  |  |
| Enduring Understandings:   |   |  |  |
| <ul style="list-style-type: none"> <li>• List and Describe each of the six nutrients needed by the body</li> <li>• Describe the function of water in the body</li> <li>• What is the Food Guide Pyramid?</li> <li>• What kind of Information is included on food label?</li> <li>• What are the levels of organization in your body?</li> <li>• What are the four basic types of tissue in the human body?</li> <li>• What is homeostasis?</li> <li>• What are the functions of the skeleton?</li> <li>• What role do movable joints play in the body?</li> <li>• What are three types of muscles in your body?</li> <li>• Why do muscles work in pairs?</li> <li>• What are the functions of the skin?</li> </ul> |   |  |  |
| Core Content/Objectives  |   | Instructional Actions  |  |
| Concepts<br><i>What students will know</i>   | Skills<br><i>What students will be able to do</i>   | Activities/Strategies<br><i>Learning Activities/ Differentiation<br/>Interdisciplinary Connections</i>   | Assessment<br><i>How learning will be assessed</i>   |
| <ul style="list-style-type: none"> <li>• Prentice Hall Book: Human Biology and Health Chapters 1 and 2</li> <li>• Define the six nutrients needed by the body</li> <li>• Describe the role of water in the body</li> <li>• Describe the Food Guide Pyramid and state how it can be used to plan a healthy diet</li> <li>• List and describe the information that is included on nutrition labels</li> <li>• Identify the levels of organization in the body</li> <li>• Identify and describe the four</li> </ul>   | <ul style="list-style-type: none"> <li>• Predict how to create a balanced diet</li> <li>• Analyze charts and guides</li> <li>• Review the cell</li> <li>• Define the six nutrients needed by the body</li> <li>• Describe the role of water in the body</li> <li>• Describe the Food Guide Pyramid and state how it can be used to plan a healthy diet</li> <li>• List and describe the information that is included on nutrition labels</li> <li>• Identify the levels of</li> </ul> | <ul style="list-style-type: none"> <li>• Journal food intake for several days and use it to analyze diet according to the Food Guide pyramid.</li> <li>• Read nutrition labels and know how to apply the information to a balanced diet</li> <li>• Activity: Iron for Breakfast</li> <li>• Body of Knowledge Activity to access baseline knowledge of human body before the unit (to be repeated at the end of the unit)</li> <li>• Begin the Body Project: At the end of the Human Body unit the students will hand in a</li> </ul> | <ul style="list-style-type: none"> <li>• Quiz on food and nutrition</li> <li>• Quiz on the parts of the skeleton</li> <li>• Test on Chapters 1 and 2 combined</li> <li>• Skeletal Layer of body project</li> <li>• Lab Report: Chicken Leg/Wing</li> </ul> |

HADDONFIELD PUBLIC SCHOOLS  
Curriculum Map for 7<sup>th</sup> grade Science

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| <p>basic types of tissue in the human body</p> <ul style="list-style-type: none"> <li>• Define homeostasis and describe physical responses to stress and ways to deal with stress~ flight or fight response</li> <li>• Introduce the systems of the body</li> <li>• Identify the functions of the skeleton and the parts of the skeleton</li> <li>• Explain the role of movable joints</li> <li>• Describe the structure of bones</li> <li>• Identify the three types of muscles and describe their functions in the body</li> <li>• Explain how skeletal muscles work in pairs</li> <li>• Describe the functions of the skin</li> <li>• Identify and describe the layers of the skin</li> </ul> | <p>organization in the body</p> <ul style="list-style-type: none"> <li>• Identify and describe the four basic types of tissue in the human body</li> <li>• Define homeostasis and describe physical responses to stress and ways to deal with stress~ flight or fight response</li> <li>• Introduce the systems of the body</li> <li>• Identify the functions of the skeleton and the parts of the skeleton</li> <li>• Explain the role of movable joints</li> <li>• Describe the structure of bones</li> <li>• Identify the three types of muscles and describe their functions in the body</li> <li>• Explain how skeletal muscles work in pairs</li> <li>• Describe the functions of the skin</li> <li>• Identify and describe the layers of the skin</li> </ul> | <p>layered model of the human body representing all the systems of the body.</p> <ul style="list-style-type: none"> <li>• Microscope: using the microscope view different types of body tissue</li> <li>• Lab: Chicken Leg/Wing : modeling muscles, bones, joints, and different types of tissues</li> <li>• Do Now's</li> <li>• Video: Digestion</li> </ul> |  |
| <p>Resources/Technology:</p>   |   |  |  |

HADDONFIELD PUBLIC SCHOOLS  
Curriculum Map for 7<sup>th</sup> grade Science

| <i>February</i>   |   |   |   |
|---|---|---|---|
| Targeted Standard(s): NJCCCS  |   |   |   |
| Enduring Understandings:  |   |   |   |
| Essential Questions:<br>What factors control the inheritance of traits in organisms?<br>How do the principles of probability help explain Mendel's results?<br>How do geneticists use Punnett Squares?<br>What role do chromosomes play in inheritance?<br>What events occur during Meiosis?<br>What is meant by the term genetic code?   |   |   |   |
| Core Content/Objectives   |   | Instructional Actions   |   |
| Concepts<br><i>What students will know</i>  | Skills<br><i>What students will be able to do</i>   | Activities/Strategies<br><i>Learning Activities/ Differentiation<br/>Interdisciplinary Connections</i>  | Assessment<br><i>How learning will be assessed</i>  |
| <ul style="list-style-type: none"> <li>• Mendel's Genetics experiments</li> <li>• Factors that control the inheritance of traits in organisms</li> <li>• Explain how geneticists use symbols to represent alleles</li> <li>• Principles of probability</li> <li>• Punnett squares</li> <li>• The meanings of terms phenotype, genotype, homozygous, heterozygous, codominance</li> <li>• Describe the role of chromosomes in inheritance</li> <li>• Identify and describe the events that occur during meiosis</li> </ul> | <ul style="list-style-type: none"> <li>• Describe Mendel's Genetics experiments</li> <li>• Identify Factors that control the inheritance of traits in organisms</li> <li>• Explain how geneticists use symbols to represent alleles</li> <li>• Describe the Principles of probability and how Mendel applied them to inheritance</li> <li>• State how geneticists used Punnett squares and be able to use one themselves</li> <li>• Develop hypotheses about whether traits controlled by dominant alleles are more common than traits controlled by recessive alleles</li> <li>• Interpret data about certain traits controlled by dominant and recessive</li> </ul> | <ul style="list-style-type: none"> <li>• Inquiry challenges involving Punnett squares</li> <li>• Creating models of Mendel's pea plant experiments</li> <li>• Puppy Genetics (using Punnett squares) Project</li> <li>• Take a Class survey of traits Lab</li> <li>• Make the Right Call Lab</li> <li>• Making models of Meiosis</li> </ul> | <ul style="list-style-type: none"> <li>• Puppy Genetics (using Punnett squares) Project</li> <li>• Take a Class survey of traits Lab</li> <li>• Make the Right Call Lab</li> <li>• Making models of Meiosis</li> <li>• Tests and quizzes</li> </ul> |

HADDONFIELD PUBLIC SCHOOLS  
Curriculum Map for 7<sup>th</sup> grade Science

|                       |   |  |  |
|-----------------------|---|--|--|
|                       | <p>alleles in humans</p> <ul style="list-style-type: none"><li>• Draw conclusions about the frequency and the variation of certain traits in the class.</li><li>• The meanings of terms phenotype, genotype, homozygous, heterozygous, co-dominance</li><li>• Model the combination of alleles in a genetic cross</li><li>• Predict the offspring of a genetic cross</li><li>• Analyze data from models of genetic crosses</li><li>• Compare actual data with predicted outcomes</li><li>• Describe the role of chromosomes in inheritance</li><li>• Identify and describe the events that occur during meiosis</li></ul> |  |  |
| Resources/Technology: |   |  |  |
|                       |   |  |  |