

# Science 7 - Overview

Content Area: **Science**  
Course(s): **Science 7**  
Time Period:  
Length: **N/A**  
Status: **Published**

## Cover

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### **EAST BRUNSWICK PUBLIC SCHOOLS**

**East Brunswick New Jersey**

**Superintendent of Schools**

Dr. Victor P. Valeski

**Science**

**Science 7**

Course Number: 3110

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**Course Adoption: 4/21/1986**

**Curriculum Adoption: 5/9/1991**

## Course Overview

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Units	Labs/Activities	Technology
<p><b>MP1</b> <b>Unit 1 - Science Practice</b></p> <p><b>Essential Theme:</b> Building science skills such as evidence analysis, model creation, measurements, and graphing are an important part of science learning.</p> <p><b>Essential Question:</b> How are mathematics, language arts and technology skills woven into the discipline of science?</p>	<ol style="list-style-type: none"><li>1. Introduction, and class expectations, create technology contract</li><li>2. Create language stems for class discussions</li><li>3. Identify experimental variables and create controlled experiment</li><li>4. Model criteria list creation</li><li>5. Evidence criteria list and rating.</li><li>6. Claim evidence reason introduction and practice</li><li>7. Sam Spade - application of evidence and modeling skills</li><li>8. Measuring practice</li><li>9. Graphing analysis</li><li>10. Density calculations and predictions with Density Tanks</li></ol>	<ul style="list-style-type: none"><li>• Technology contract agreement</li><li>• Language stems - google classroom</li><li>• Graphing - spreadsheets, I see, I understand</li><li>• Gizmo - Growing Plants</li></ul>
<p><b>Unit 2 - Plate Tectonics:</b></p> <p><b>Essential Theme:</b> The Earth's land masses are in a continuous state of change.</p> <p><b>Essential Question:</b> How can geologic evidence be used to develop a model of plate movement?</p>	<ol style="list-style-type: none"><li>1. Earth's interior/canister lab - making observations and inferences</li><li>2. Layers of the Earth Project/presentation</li><li>3. Convection current lab</li><li>4. Convection current Gizmo</li><li>5. Wegener history</li><li>6. Evidence for Pangaea Gizmo</li><li>7. Plate Tectonics evidence and models</li></ol>	<ul style="list-style-type: none"><li>• Layers of the earth research and presentation</li><li>• Gizmos - Plate Tectonics and Pangaea</li></ul>
<p><b>MP2</b> <b>Unit 3 - Earthquakes and</b></p>	<ol style="list-style-type: none"><li>1. Stress – What causes Earthquakes?</li></ol>	<ul style="list-style-type: none"><li>• Fracking research and debate</li></ul>

## Volcanoes

**Essential Theme:** The Earth's crust is continuously influenced by geologic events.

**Essential Question:** How can data of past geologic events be used to predict location and severity of future episodes?

2. Seismic waves/Seismic Safety
3. Epicenter Lab
4. Earthquake Risk Lab
5. Fracking Lab/ debate
6. Types of Volcanoes – quiet vs. explosive, dormant, extinct, active
7. Volcano Hazards
8. Pompeii Investigation
9. Volcano/earthquake plotting
10. Volcano research/ groups

- Plotting earthquakes and volcanoes
- Gizmo - Recording Station
- Research on volcano
- Different ways volcano form based on boundary
- How to volcanoes explode- design a model

## Unit 4 - Geotime

**Essential Theme:** The current Earth and its inhabitants are a product of multiple and varied deep time events.

1. Fossil Classification Lab
2. Relative Dating lab
3. Geo-time group project (research and presentations)

- Research geological time and presentation
- Relative dating simulation - science learning hub

**Essential Question:** How can physical data be used to estimate the age of the earth and its progression.

## MP3

### Unit 5 - Cells

**Essential Theme:** Cells are the basic unit of life on Earth.

**Essential Question:** How can the structure of a cell or a cell's organelle determine its function?

1. History and Timeline of Cell Theory Development
2. Microscopes - Investigation of Cells
3. Evidence of chloroplast structure and function to create a scientific model
4. Evidence of nucleus structure and function to create a scientific model
5. Evidence of Mitochondria structure and function - Current research of mouse cells
6. Cell anatomy - plant vs animal
7. Cell Division - Mitosis
8. Specialized Cells research and project

- Specialized cells research
- Online evidence
- Gizmo - Cell Structure
- Parts of the cell - online textbook
- Cell division/mitosis online textbook

## Unit 6 - Genetics

1. Genetic Traits
2. Inheritance Models

- Penny lab computer
- Gizmos - Mouse Genetics

Essential Theme: Cells reproduce cells that are genetically similar to themselves.

Essential Question: Why are offspring genetically similar, but different from their parents at both an individual and cellular level?

3. Analyze Pedigree (One Trait)
4. Chromosome Lab
5. Vocab Terms/Line Diagrams
6. Mutations/ Cancer
7. Punnett Square
8. Patterns of inheritance:  
Incomplete Dominance,  
Codominance
9. Probability Lab
10. DNA Bases
11. DNA Base Pairing
12. Strawberry Lab
13. DNA Replication
14. Protein Synthesis

## MP4

### Unit 7 - Evolution

Essential Theme: Natural selection of genes within a population allows for a change in gene frequency.

Essential Question: Why do some organisms survive and others do not? How does this survival effect the long term gene frequency in a population?

1. Intro to Evolution/ Variation and Selection Discussion
2. Case Study: Mountain Sheep Evidence and Models
3. Case Study: Peppered Moth evidence and models
4. Case Study: Snakes evidence and models
5. Create general model of Natural Selection
6. Analyze evidence of evolution
7. Rate of Change
8. Natural Selection Simulation Lab - Pickworm

- Gizmo - Moth and Skulls

### Unit 8 - Force and Motion

Essential Theme: An object's motion is dependent upon the forces acting on it and the mass of the object.

Essential Question: How can data from an object in motion be used to predict its future motion?

### Unit 9 - Energy

Essential Theme: Energy drives

1. Relative Motion
  2. How Fast How Far Lab
  3. Speed/Velocity/Momentum - gizmo
  4. Acceleration Lab
  5. Motion graph
  6. Force Diagrams
  7. Friction Stations
  8. Newton's Laws - Gizmo
  9. Rocket/Egg Drop
1. Catapult lab
  2. Rollercoaster simulation - nat geo coaster creator
  3. Shelves gizmo
  4. Sleds gizmo

- Gizmo - Runners

- Gizmo - Shelves, Energy of a Pendulum, Sled Wars, Distance Time
- Rollercoaster simulation- nat geo coaster creator

all systems on the Earth.

Essential Question: How are different energy forms converted and used in various systems?

## **Textbooks and other resources**

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*Grade 7 Interactive Science: Custom Edition for East Brunswick Public Schools*, Pearson Education, 2012

## **Standards**

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CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
SCI.HS-PS3-2	Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects).
SCI.MS-ESS2-1	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
SCI.MS-ESS1-4	Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.
SCI.MS-ESS2-2	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
SCI.MS-ESS2-3	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
SCI.MS-ESS3-1	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
SCI.MS-ETS1-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
SCI.MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
SCI.MS-ETS1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
SCI.MS-ETS1-4	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
SCI.MS-LS4-4	Construct an explanation based on evidence that describes how genetic variations of traits

	in a population increase some individuals' probability of surviving and reproducing in a specific environment.
SCI.MS-LS1-1	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
SCI.MS-LS1-4	Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
SCI.MS-LS1-2	Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
SCI.MS-LS4-6	Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.
SCI.MS-LS1-5	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
SCI.MS-LS4-5	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.
SCI.MS-PS3-1	Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
SCI.MS-PS2-2	Plan 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.
SCI.MS-PS2-4	Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.
SCI.MS-PS2-1	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
SCI.MS-PS3-5	Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.
TECH.8.1.5	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.5.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.5.C	Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

## **Grading and Evaluation Guidelines**

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Marking period grades for Science 7 will be determined using the following weighting:

10% Homework

40% Common Assessments

50% Classwork and Labs

The final grade for the course Science 7 will be the average of the four marking period grades.

## **Other Details**

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### **53237 Science (Grade 7)**

Science (Grade 7) courses build on previous years of scientific inquiry and typically include subject matter from several strands of science, including earth sciences, physical sciences, and life or environmental sciences, and may organize material around thematic units. Specific content depends upon state standards for grade 7.