

**Secaucus
Board of
Education**

Grade 5 Science Curriculum

Course Code: 4511

Curriculum and Instruction Department



Born on August, 2015
Aligned to New Jersey Student Learning
Standards - Science (2014)
Approved by the Secaucus Board of Education
on August 27, 2015

District Equity Statement

The Board of Education directs that all students enrolled in the schools of this district shall be afforded equal educational opportunities in strict accordance with the law. No students shall be denied access to or benefit from any educational program or activity or from a co-curricular or athletic activity on the basis of the student’s race, color, creed, religion, national origin, ancestry, age, marital status, affectional or sexual orientation, gender, gender identity or expression, socioeconomic status, or disability...The Board directs the Superintendent to allocate faculty, administrators, support staff members, curriculum materials, and instructional equipment supplies among and between the schools and classes of this district in a manner that ensures equivalency of educational opportunity throughout this district. The school district’s curricula in the following areas will eliminate discrimination, promote mutual acceptance and respect among students, and enable students to interact effectively with others, regardless of race, color, creed, religion, national origin, ancestry, age, marital status, affectional or sexual orientation, gender, gender identity or expression, socioeconomic status, or disability:

1. School climate/learning environment
2. Courses of study, including Physical Education
3. Instructional materials and strategies
4. Library materials
5. Software and audio-visual materials
6. Guidance and counseling
7. Extra-curricular programs and activities
8. Testing and other assessments.

Excerpt from Secaucus Board of Education, Policy 5750, Edited September 2016

Fifth Grade Science Course Description

The Fifth grade Science Curriculum is taught using *New Jersey Center for Teaching and Learning Progressive Science Initiative* coursework. All components of these units present a balance of Biological, Physical, Earth/Space and Environmental Science topics. The units covered in this course include: Matter and Its Interactions, Earth's systems, Human Impacts on Earth and Forces. All courses are designed to prepare students for The New Jersey Assessment of Skills and Knowledge (NJASK8), their middle school science courses, and to potentially solve scientific problems and issues in their everyday lives.

The material is presented at a moderate pace. Lessons are based on discussions and student- driven activities. Hands-on activities are meant to show connections to real-life science applications and to promote critical thinking and problem solving skills. Students who are placed in this course based on ESL placement will also receive proper accommodations based upon their ESL level. Students receiving Special Education services will receive modifications and accommodations to information and assessments as indicated in their Individual Education Plan.

Course Modifications (ELLs, Special Education, Gifted and Talented)

The course instructor will determine, with the assistance of guidance counselors, teacher assistant/aides, and/or special education teachers, what modifications will be made for his/her students. Such examples of modifications can include, but not be limited to:

- Extended time as needed
- Modification of tests and quizzes
- Preferential seating
- Alternative/Formative assessment (projects)
- Effective teacher questioning (ranging from simple recall to higher order critical thinking questions)
- Supplemental materials
- Cooperative learning
- Teacher tutoring
- Peer tutoring
- Differentiated Instruction

Interdisciplinary Connections

The following NJSL Standards for ELA and Mathematics depict what standards align to the science standards taught in this 5th Grade Science Course.

NJSLS - ELA/Literacy:

- RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-PS1- 1)
- W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (5-PS1-2),(5-PS1-3),(5-PS1-4)
- W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (5-PS1-2),(5-PS1-3),(5-PS1-4)
- W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (5-PS1-2),(5-PS1-3),(5-PS1-4)
- RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-PS2-1)
- RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-PS2-1)
- W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-PS2-1)
- RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-PS3- 1)

- SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5- PS3-1)
- RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-LS1-1)
- RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-LS1-1)
- W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-LS1-1)
- RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-LS2- 1)
- SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5- LS2-1)
- RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-ESS1-1)
- RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-ESS1-1)
- RI.5.8 Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s). (5-ESS1-1)
- RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-ESS1-1)
- W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-ESS1-1)

- SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5- ESS1-2)
- RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-ESS2- 1),(5-ESS2-2)
- W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (5-ESS2-2)
- SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5- ESS2-1),(5-ESS2-2)
- RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-ESS3-1)
- RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.(5-ESS3-1)
- RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-ESS3-1)
- W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (5-ESS3-1)
- W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (5-ESS3-1)
- RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (3-5-ETS1-2)
- RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (3-5- ETS1-2)

- RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (3-5-ETS1-2)
- W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (3-5-ETS1-1),(3-5-ETS1-3)
- W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (3-5-ETS1-1),(3-5-ETS1-3)
- W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (3-5-ETS1-1),(3-5-ETS1-3)

NJSLS - Mathematics:

- MP.2 Reason abstractly and quantitatively. (5-PS1-1),(5-PS1-2),(5-PS1-3)
- MP.4 Model with mathematics. (5-PS1-1),(5-PS1-2),(5-PS1-3)
- MP.5 Use appropriate tools strategically. (5-PS1-2),(5-PS1-3)
- 5.NBT.A.1 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. (5-PS1-1)
- 5.NF.B.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (5-PS1-1)
- 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real-world problems. (5-PS1-2)

- 5.MD.C.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement. (5-PS1-1)
- 5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. (5-PS1-1)
- MP.2 Reason abstractly and quantitatively. (5-LS1-1)
- MP.4 Model with mathematics. (5-LS1-1)
- MP.5 Use appropriate tools strategically. (5-LS1-1)
- 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. (5-LS1-1)
- MP.2 Reason abstractly and quantitatively. (5-LS2-1)
- MP.4 Model with mathematics. (5-LS2-1)
- MP.2 Reason abstractly and quantitatively. (5-ESS1-1),(5-ESS1-2)
- MP.4 Model with mathematics. (5-ESS1-1),(5-ESS1-2)
- 5.NBT.A.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. (5-ESS1-1)
- 5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5-ESS1-2)
- MP.2 Reason abstractly and quantitatively. (5-ESS2-1),(5-ESS2-2)
- MP.4 Model with mathematics. (5-ESS2-1),(5-ESS2-2)
- 5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5-ESS2-1)
- MP.2 Reason abstractly and quantitatively. (5-ESS3-1)

- MP.4 Model with mathematics. (5-ESS3-1)
- MP.2 Reason abstractly and quantitatively. (3-5-ETS1-1),(3-5-ETS1-2),(3-5-ETS1-3)
- MP.4 Model with mathematics. (3-5-ETS1-1),(3-5-ETS1-2),(3-5-ETS1-3)
- MP.5 Use appropriate tools strategically. (3-5-ETS1-1),(3-5-ETS1-2),(3-5-ETS1-3)
- 3-5.OA Operations and Algebraic Thinking (3-5-ETS1-1),(3-5-ETS1-2)

5th Grade Science Curriculum

Unit 1: Matter and Its Interactions	Unit 2: Earth’s Systems
<p>PS1.A: Structure and Properties of Matter Matter of any type can be subdivided into particles that are too small to see but even then the matter still exists and can be detected by other means. A model shows that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects.(5-PS1-1) The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish.(5-PS1-2) Measurements of a variety of properties can be used to identify materials (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.)(5-PS1-3)</p> <p>PS1.B: Chemical Reactions When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4) No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass And weight are not distinguished at this grade level.)(5-PS1-2)</p>	<p>ESS2.A:Earth Materials and Systems Earth’s major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere(living things, including humans). These systems interact in multiple ways to affect Earth’s surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.(5-ESS2-1)</p> <p>ESS2.C:The Roles of Water in Earth’s Surface Processes Nearly all of Earth’s available water is in the ocean. Most freshwater is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.(5-ESS2-2)</p>
Unit 3: Human Impacts on Earth	Unit 4: Forces
<p>ESS3.C:Human Impacts on Earth Systems Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and</p>	<p>PS2.B: Types of Interactions The gravitational force of Earth acting on an object near Earth’s surface pulls that object toward the planet’s center.(5-PS2-1)</p>

communities are doing things to help protect Earth.	
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Unit 1 – Matter and Its Interactions			
Teacher:	SBOE Faculty	Time Frame:	27 Days
Grade:	5	School:	SBOE
Subject:	Science		
<u>NJSLS - SCIENCE/DCI</u> PS1.A: Structure and Properties of Matter	<p>Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects. (5-PS1-1)</p> <p>The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (5-PS1-2)</p> <p>Measurements of a variety of properties can be used to identify materials. (5-PS1-3)</p>		
PS1.B: Chemical Reactions	<p>When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4)</p> <p>No matter what reaction or change in properties occurs, the total weight of the substances does not change. (5-PS1-2)</p> <p>http://www.nextgenscience.org/5ps1-matter-interactions</p>		
Instructional Objective: 5-PS1-1	Develop a model to describe that matter is made of particles too small to be seen.		
Instructional Objective: 5-PS1-2	Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.		
Instructional Objective:	Make observations and measurements to identify materials based on their properties.		

5-PS1-3	
Instructional Objective: 5-PS1-4	Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
Essential Questions	
(What questions will the student be able to answer as a result of the instruction?)	
<ol style="list-style-type: none"> 1. What is matter and what is it made of? 2. What happens to the mass of matter as goes through its different forms (solid, liquid, gas)? 3. What are the identifiable properties of a substance? 4. When two substances are mixed together, is something completely new and different always made? 	
Knowledge & Skills	
(What skills are needed to achieve the desired results?)	
<p>By the end of this unit, students will know:</p> <ul style="list-style-type: none"> ● Matter is a term that applies to all of the stuff around us and it is made of particles that are too small to see. ● When substances are heated, cooled, or mixed the total weight before and after is always the same. ● Substances can be identified based on observable and measureable properties. ● Sometimes when two substances are mixed, each of the substances keeps its original properties and sometimes a new substance is formed. 	<p>By the end of this unit, students will be able to:</p> <ul style="list-style-type: none"> ● Give an examples of what is matter ● Describe how gases are made from matter particles that are too small to be seen. (Ex: an inflated balloon) ● Measure and graph the weights of matter before and after being heated, cooled, or mixed. ● Identify materials based on various observable properties. ● Determine whether the mixing of two substances always results in the formation of new substances or not and provide examples. ● Identify the differences between soluble and insoluble solutions.
Assessment	
Acceptable evidence to show desired results	

During the Smart Notebook lesson designed to introduce concepts, students will be continually questioned on these concepts using a combination of class work/homework questions and the SMART Response system. Classwork and Homework questions will be discussed as a class.

Lab 1: Mass of Air

Quiz 1: What is Matter?

Lab 2: Changing States of Matter

Quiz 2: Conservation of Mass

Lab 3: Describing Matter

Lab 4: Identifying Mystery Substances

Quiz 3: Observable Properties of Matter

Lab 5: Solutions

Lab 6: Conservation of Mass in Solutions

Optional Demonstration: Chemical Reaction Demonstration

Lab 7: Conservation of Mass in Chemical Reactions

Optional Quiz 4: Mixing Substances

Unit Test

Suggested Sequence of Topic and Daily Activities

Day	Topic	Classwork	Homework
1	What is Matter?	Slides 1-18 Classwork #1	Homework #1, Questions 1-2
2	Mass of Air	Lab 1: Mass of Air Student Lab Sheet; Slides 19-22	Finish lab sheet; Homework #1, Questions 3-4
3	The Conservation of Mass	Slides 23-27 Classwork #2	Homework #2
4	What is Matter?	Quiz 1: What is Matter? Lab 2: Changing States of Matter; Slides 28-31 Student Lab Sheet	Finish lab sheet Study for Quiz
5	Conservation of Mass; Properties of Matter	Quiz 2 Conservation of Mass; Slides 32-36;	N/A
6	Properties of Matter	Slides 37-44 Classwork #3	Homework #3
7	Properties of Matter	Lab 3 Describing Matter, Student Lab Sheet; Slide 45	Finish lab sheet
8	Properties of Matter	Lab 4 Identifying Mystery Substances, Student Lab Sheet;	Finish lab sheet Study for Quiz

		Slide 46	
9	Properties of Matter; Mixing Substances	Quiz 3 Observable Properties of Matter Slides 47-51	N/A
10	Solutions	Slides 52-58 Classwork #4	Homework #4
11	Solutions	Lab 5 Solutions, Student Lab Sheet Slide 59	Finish lab sheet;
12	Conservation of Mass in Solutions	Lab 6 Conservation of Mass in Solutions, Student Lab Sheet; Slides 60-63	Finish lab sheet
13	Conservation of Mass in Chemical Reactions	*Optional – Demonstration Chemical Reactions Lab 7 Conservation of Mass in Chemical Reactions, Student Lab Sheet; Slide 64-67	Finish lab sheet
14	Unit Test Review	Study Guide Review Game	Study for Test
15	Unit Test	Test	N/A

*While there are many slides for each topic, several slides within the notebook are hidden and won't be used during instructional time.

**HW Problems are currently not scaffolded from least to most difficult, but are instead listed in order of topic. A guide is provided above.

***Lessons are based on 40 minute periods and may need to be adjusted to fit your schedule

Unit 2 – Earth’s Systems			
Teacher:	SBOE Faculty	Time Frame:	24 days
Grade:	5	School:	SBOE
Subject:	Science		
<p><u>NJSLS - SCIENCE/DCI</u></p> <p>5-ESS2-A: Earth Materials and Systems</p> <p>5-ESS2.C: The Roles of Water in Earth’s Surface Processes</p>		<p>Earth’s major systems are the geosphere(solid and molten rock, soil, and sediments), the hydrosphere(water and ice), the atmosphere (air), and biosphere(living things, including humans).</p> <p>These systems interact in multiple ways to affect Earth's Surface materials and processes.The ocean supports a variety of ecosystems and organisms, shapes landforms,and influences climate.Winds and clouds in the atmosphere interact with the land forms to determine patterns of weather.(5-ESS2-1)</p> <p>Nearly all of Earth's available water is in the ocean. Most freshwater is in glaciers or underground; only a tiny fraction is in streams, lakes,wetlands, and the atmosphere.(5-ESS2-2)</p> <p>http://www.nextgenscience.org/5ess2-earth-systems</p>	
Instructional Objective: 5-ESS2-1:		Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	
Instructional Objective: 5-ESS2-2:		Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.	
Essential Questions			
(What questions will the student be able to answer as a result of the instruction?)			
5. What are the four major systems that make up our Earth and how do they interact?			
6. What are the four layers of the Earth and what are the characteristics of each?			

7. What are the components of our atmosphere and how is the atmosphere affected by animals and plants?
8. Where is the water on Earth located? How much of this water is usable by humans?
9. What effect does ocean water have on the nearby land?

Knowledge & Skills

(What skills are needed to achieve the desired results?)

By the end of this unit, students will know:

- Earth is a nonliving object that is made up of four major systems.
- The Earth’s geosphere is composed of four distinct layers.
- Animals and plants rely on each other to create the gases needed for survival.
- The ozone layer protects us from the Earth’s harmful UV rays.
- The vast majority of water on Earth is salt water and unusable. Most of the water that is usable is trapped in glaciers.
- Areas that are near water will have milder climate changes because the ocean will slowly absorb and release heat.

By the end of this unit, students will be able to:

- Explain the four major systems of the Earth.
- Differentiate between the different layers of the Earth based on distinct characteristics.
- Explain the relationship between plants and animals when it comes to the production of oxygen and carbon dioxide.
- Describe how life on Earth would be different if the ozone layer continues to be depleted.
- Interpret and create graphs that represent the location of both salt and fresh water on Earth.
- Analyze lab results that suggest that areas near water will see milder temperature fluctuations than areas that are further inland.

Assessment

Acceptable evidence to show desired results

During the Smart Notebook lesson designed to introduce concepts, students will be continually questioned on these concepts using a combination of class work/homework questions and the SMART Response system. Classwork and Homework questions will be discussed as a class.

Quiz 1 – Geosphere

Quiz 2 – Atmosphere
 Activity – Graphing Water
 Lab – Water’s Effect on the Environment
 Quiz 3 – Hydrosphere
 Activity – Sphere Interactions
 Quiz 4 - Biosphere
 Unit Test

Suggested Sequence of Topic and Daily Activities

Day	Topic	Classwork	Homework
1	Geosphere	Slides #1-19	N/A
2	Geosphere	Slides #20-28 Questions #1-5	Questions #6-10
3	Atmosphere	Slides #29-47	Study for quiz
4	Geosphere	Quiz #1 Geosphere; Questions #11-15	Questions #16-20
5	Atmosphere	Slides #48-61 Questions #21-23	Study for quiz

6	Atmosphere	Quiz #2 Atmosphere; Slide #62 Begin Activity – Graphing Water	Questions #26-27
7	Hydrosphere	Slide#62; Continue Activity – Graphing Water	Finish Activity
8	Hydrosphere	Slides #63 - 75 Questions #24-25	Questions #28-30
9	Hydrosphere	Slides #76-78; Lab: Water’s Effect on the Environment	Finish Activity
10	Biosphere	Slides #79-98	Study for quiz
11	Hydrosphere; Biosphere	Quiz #3 Hydrosphere; Question #31	Question #34-35
12	Biosphere	Slide #99 Activity – Sphere Interactions	Finish Activity
13	Biosphere	Review Sphere Interactions; Question #32-33	Study for quiz

14	Biosphere	Quiz #4 Biosphere; Study Guide	Study Guide
15	Review	Study Guide; Review Game	Study for test
16	Unit Test	Unit Test	N/A

*While there are many slides for each topic, several slides within the notebook are hidden and won't be used during instructional time.

**HW Problems are currently not scaffolded from least to most difficult, but are instead listed in order of topic.

***Lessons are based on 40 minute periods and may need to be adjusted to fit the schedule of your school

Unit 3 Lesson Plan – Human Impacts on Earth			
Teacher:	SBOE Faculty	Time Frame:	30 days
Grade:	5 th	School:	SBOE
Subject:	Science		
<u>NJSLS - SCIENCE/DCI</u> ESS3.C: Human Impacts on Earth Systems		Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments. (5-ESS3-1) http://www.nextgenscience.org/5ess3-earth-human-activity	
Instructional Objective: 5-ESS3-1		Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.	
Essential Questions			
(What questions will the student be able to answer as a result of the instruction?)			
10. What impacts, both positive and negative, do humans have on the Earth? 11. What is Global Change? 12. How can humans reduce their impacts on Earth?			
Knowledge & Skills			
(What skills are needed to achieve the desired results?)			
By the end of this unit, students will know: <ul style="list-style-type: none"> • How humans negatively impact Earth's systems. • How humans positively impact Earth systems. • The impacts of human activities and consumption of natural resources 		By the end of this unit, students will be able to: <ul style="list-style-type: none"> • Describe humans’ impact on Earth systems • Explain the impact that increasing human populations have on natural resources. • Identify changes humans can make to lessen their impact on the Earth’s systems. 	

Assessment**Acceptable evidence to show desired results**

During the Smart Notebook lesson designed to introduce concepts, students will be continually questioned on these concepts using a combination of class work/homework questions and the SMART Response system. Classwork and Homework questions will be discussed as a class and misconceptions will be addressed by the teacher prior to the formal evaluations listed below.

Activity: Anthropocene Timeline

Activity: Ecological Footprint

Quiz 1: Human Impacts & Importance of the Environment

Activity: Carrying Capacity

Activity: Water Pollution

Lab: Greenhouse Effect

Activity: Biosphere

Quiz 2: Negative Impacts

Activity: Upcycling

Lab: Recycling

Quiz 3: Positive Impacts & Methods of Reduction

Unit Test

Suggested Sequence of Topic and Daily Activities			
Day	Topic	Classwork	Homework
1	Humans Impact on Earth	Slides 1-21; Questions 1-3	Questions 6-8
2	Ecological Footprints	Slides 22-34; Questions 4-5	Question 9
3	Ecological Footprints	Slide 35 Anthropocene Timeline	Ecological Footprint Worksheet
4-6	Ecological Footprints	Slide 36 Ecological Footprint Activity	Finish Ecological Footprint Activity; Study for quiz
7	Negative Human Impacts	Human Impacts Quiz; Slides 37-48; Question 10	Questions 27-28
8	Negative Human Impacts	Slide 49 Carrying Capacity Activity	Finish Carrying Capacity Questions

9	Negative Human Impacts: Pollution	Slides 50-65; Questions 11	N/A
10	Negative Human Impacts: Land and Water	Slides 66-80 Questions 12-15	Questions 29-32
11	Negative Human Impacts: Water	Slide 81 Water Pollution Activity	Finish Water Pollution Activity
12	Negative Human Impacts: Air	Slides 82-91; Questions 16 - 20	Questions 33-34
13	Negative Human Impacts: Air	Slide 92 Greenhouse Effect Lab	Questions 35-36
14	Negative Human Impacts: Biosphere	Slides 93-110; Questions 21-26	Questions 37-40
15	Negative Human Impacts: Biosphere	Slide 111 Biodiversity Activity	Finish Biodiversity Activity; Study for quiz

16	Positive Human Impacts	Negative Human Impacts Quiz; Slide 112-113 Upcycling Activity	Upcycling Activity – Gather materials
17	Positive Human Impacts	Upcycling Activity	N/A
18	Positive Human Impacts	Slides 114-128; Questions 41-43	Questions 46-48
19	Methods of Reduction	Slide 129 Recycling Lab	Finish Activity
20	Methods of Reduction	Slides 130-143; Questions 44-45	Questions 49-50; Study for quiz
21	Positive Human Impacts	Positive Human Impacts Quiz; Test Study Guide	Finish Test Study Guide
22	Unit Review	Unit Review	Study for test
23	Unit Test	Unit Test	N/A

- *While there are many slides for each topic, several slides within the notebook are hidden and won't be used during instructional time.
- **HW Problems are currently not scaffolded from least to most difficult, but are instead listed in order of topic.
- ***Lessons are based on 40 minute periods and may need to be adjusted to fit the schedule of your school.

Unit 4 – Forces

Teacher:	SBOE Faculty	Time Frame:	18 Days
Grade:	5th	School:	SBOE
Subject:	Science		
NJSLS - SCIENCE/DCI			
5-PS2 Motion and Stability: Forces and Interactions	The gravitational force of Earth acting on an object near Earth’s surface pulls that object toward the planet’s center. (5-PS2-1)		
Instructional Objective: PS2.B:	Support an argument that the gravitational force exerted by Earth on objects is directed down.		
Essential Questions			
(What questions will the student be able to answer as a result of the instruction?)			
<ul style="list-style-type: none"> ● How is motion measured? ● How is speed calculated? ● What are contact forces (applied, frictional and normal)? ● What are non-contact forces? ● How do you know if forces are balanced or unbalanced? ● How do magnetic fields work? ● How do electrical fields work? ● How did scientists learn about gravitational force? ● When objects are dropped, which object will hit the ground first? ● How does increasing the distance between two objects change the force of gravity between those objects? ● How does changing the mass of two objects change the force of gravity between those objects? 			

Knowledge & Skills

(What skills are needed to achieve the desired results?)

By the end of this unit, students will know:

- How motion and speed are measured and calculated
- The difference between contact and non-contact forces
- The forces that act on a falling object
- The history of our understanding of gravity
- The relationship between mass and distance and how they relate to the force of gravity
- An object’s mass does not influence the force of Earth’s gravity on it

By the end of this unit, students will be able to:

- Calculate speed, distance and time
- Differentiate between contact and non-contact forces
- Describe contact forces – applied, frictional and normal
- Describe non-contact forces – magnetic, electrical and gravitational
- Explain how the concept of gravity was observed throughout history
- Form hypotheses about the rate at which objects will fall when dropped
- Explain how mass and distance relate to the strength of gravity

Assessment

Acceptable evidence to show desired results

During the Smart Notebook lesson designed to introduce concepts, students will be continually questioned on these concepts using a combination of class work/homework questions and the SMART Response system. Classwork and Homework questions will be discussed as a class and misconceptions will be addressed by the teacher prior to the formal evaluations listed below.

Lab: Electric Field Hockey

Quiz 1: Motion & Forces

Lab: Race to the Bottom

Lab: Gravity Simulation

Quiz 2: Gravity

Unit Test			
Suggested Sequence of Topic and Daily Activities			
Day	Topic	Classwork	Homework
1	Motion Review	Slides 4-18	N/A
2	Motion Review	Slides 19-28; Classwork #1	Homework #1
3	Forces Review	Slides 29-47	N/A
4	Forces Review	Slides 48-62; Classwork #2	Homework #2
5	Forces Review	Slides 63-75	N/A
6	Forces Review	Slides 76-93	N/A
7	Forces Review	Slides 94-107; Classwork #3	Homework #3
8	Forces Review	Slide 108 Lab: Electric Field Hockey	Finish Lab Questions

9	Gravity	Slides 109-130	Study for quiz
10	Motion, Forces & Gravity	Quiz 1: Motion & Forces; Slides 131-139	N/A
11	Gravity	Slide 140 Lab: Race to the Bottom	Finish Lab Questions
12	Gravity	Slides 141-157; Classwork #4	Homework #4
13	Gravity	Slide 158 Gravity Simulation	Finish Lab Questions; Study for quiz
14	Gravity	Quiz 2: Gravity; Study Guide	Study Guide
15	Unit Review	Unit Review	Study for test
16	Unit Test	Unit Test	N/A

*While there are many slides for each topic, several slides within the notebook are hidden and won't be used during instructional time.

**HW Problems are currently not scaffolded from least to most difficult, but are instead listed in order of topic.

***Lessons are based on 40 minute periods and may need to be adjusted to fit the schedule of your school.