EGG HARBOR TOWNSHIP PUBLIC SCHOOLS
CURRICULUM

Elementary School Science
Grades 4-5

Length of Course:	Full Year
Elective / Required:	N/A
Schools:	Miller
Student Eligibility:	Grades 4 and 5
Credit Value:	N/A
Date Submitted:	March 2017
Date Approved:	

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DISTRICT MISSION STATEMENT

Our mission in the Egg Harbor Township School District is to partner with the student, family, school and community to provide a safe and rigorous learning environment which will result in a mastery of the NJ Common Core Standards at all grade levels. Students will demonstrate academic scholarship, integrity, leadership, citizenship, while developing a strong work ethic so that they will act responsibly in their school community and every day society.

SCIENCE – PHILOSOPHY

We believe that ALL students regardless of race, ethnicity, socio-economic status, religious background, and/or any other classification are deserving of a holistic science education. This holistic approach would include an education that will allow them to fully discover themselves, their strengths and weaknesses, and benefit from science instruction.

> Scientific literacy assumes an increasingly important role in the context of globalization. The rapid pace of technological advances, access to an unprecedented wealth of information, and the pervasive impact of science and technology on day-to-day living require a depth of understanding that can be enhanced through quality science education. In the 21st century, science education focuses on the practices of science that lead to a greater understanding of the growing body of scientific knowledge that is required of citizens in an ever-changing world (NJCCCS-Science).

Science curricula are designed to reinforce 21st Century Learning, to maximize rigor, relevance, and relationships, and to engage students individually through differentiated instruction.

SCIENCE - STATEMENT OF PURPOSE

Education exists for the purpose of enabling each individual to realize and maintain her/his full potential. Scientifically literate students possess the knowledge and understanding of scientific concepts and processes required for personal decision-making, participation in civic and cultural affairs, and economic productivity.

> Science, engineering, and technology influence and permeate every aspect of modern life. Some knowledge of science and engineering is required to engage with the major public policy issues of today as well as to make informed everyday decisions, such as selecting among alternative medical treatments or determining how to invest public funds for water supply options. In addition, understanding science and the extraordinary insights it has produced can be meaningful and relevant on a personal level, opening new worlds to explore and offering lifelong opportunities for enriching people's lives. In these contexts, learning science is

important for everyone, even those who eventually choose careers in fields other than science or engineering (NJSLS-Science)

All students engage in science experiences that promote the ability to ask, find, or determine answers to questions derived from natural curiosity about everyday things and occurrences. The underpinning of the revised standards lies in the premise that science is experienced as an active process in which inquiry is central to learning and in which students engage in observation, inference, and experimentation on an ongoing basis, rather than as an isolated a process. When engaging in inquiry, students describe objects and events, ask questions, construct explanations, test those explanations against current scientific knowledge, and communicate their ideas to others in their community and around the world. They actively develop their understanding of science by identifying their assumptions, using critical and logical thinking, and considering alternative explanations (NJCCCS-Science).

Our school district provides an extensive science program, which will enable students to succeed and compete in the global marketplace using the New Jersey Student Learning Standards as well as the Next Generation Science Standards.

INTRODUCTION

The most precious resource teachers have is time. Regardless of how much time a course is scheduled for, it is never enough to accomplish all that one would like. Therefore, it is imperative that teachers utilize the time they have wisely in order to maximize the potential for all students to achieve the desired learning.

High quality educational programs are characterized by clearly stated goals for student learning, teachers who are well-informed and skilled in enabling students to reach those goals, program designs that allow for continuous growth over the span of years of instruction, and ways of measuring whether students are achieving program goals.

THE EGG HARBOR TOWNSHIP SCHOOL DISTRICT CURRICULUM TEMPLATE

The Egg Harbor Township School District has embraced the backward-design model as the foundation for all curriculum development for the educational program. When reviewing curriculum documents and the Egg Harbor Township curriculum template, aspects of the backward-design model will be found in the stated enduring *understandings/essential questions, unit assessments,* and *instructional activities*. Familiarization with backward-design is critical to working effectively with Egg Harbor Township's curriculum guides.

GUIDING PRINCIPLES: WHAT IS BACKWARD DESIGN?
WHAT IS UNDERSTANDING BY DESIGN?

"Backward design" is an increasingly common approach to planning curriculum and instruction. As its name implies, "backward design" is based on defining clear goals, providing acceptable evidence of having achieved those goals, and then working 'backward' to identify what actions need to be taken that will ensure that the gap between the current status and the desired status is closed.

Building on the concept of backward design, Grant Wiggins and Jay McTighe (2005) have developed a structured approach to planning programs, curriculum, and instructional units. Their model asks educators to state goals; identify deep understandings, pose essential questions, and specify clear evidence that goals, understandings, and core learning have been achieved.

Programs based on backward design use desired results to drive decisions. With this design, there are questions to consider, such as: What should students understand, know, and be able to do? What does it look like to meet those goals? What kind of program will result in the outcomes stated? How will we know students have achieved that result? What other kinds of evidence will tell us that we have a quality program? These questions apply regardless of whether they are goals in program planning or classroom instruction.

The backward design process involves three interrelated stages for developing an entire curriculum or a single unit of instruction. The relationship from planning to curriculum design, development, and implementation hinges upon the integration of the following three stages.

Stage I: Identifying Desired Results: Enduring understandings, essential questions, knowledge and skills need to be woven into curriculum publications, documents, standards, and scope and sequence materials. Enduring understandings identify the "big ideas" that students will grapple with during the course of the unit. Essential questions provide a unifying focus for the unit and students should be able to answer more deeply and fully these questions as they proceed through the unit. Knowledge and skills are the *"stuff"* upon which the understandings are built.

Stage II: Determining Acceptable Evidence: Varied types of evidence are specified to ensure that students demonstrate attainment of desired results. While discrete knowledge assessments (e.g.: multiple choice, fill-in-the-blank, short answer, etc…) will be utilized during an instructional unit, the overall unit assessment is performance-based and asks students to demonstrate that they have mastered the desired understandings. These culminating (summative) assessments are authentic tasks that students would likely encounter in the real-world after they leave school. They allow students to demonstrate all that they have learned and can do. To demonstrate their understandings students can explain, interpret, apply, provide critical and insightful points of view, show empathy and/or evidence self-knowledge. Models of student performance and clearly

defined criteria (i.e.: rubrics) are provided to all students in advance of starting work on the unit task.

Stage III: Designing Learning Activities: Instructional tasks, activities, and experiences are aligned with stages one and two so that the desired results are obtained based on the identified evidence or assessment tasks. Instructional activities and strategies are considered only once stages one and two have been clearly explicated. Therefore, congruence among all three stages can be ensured and teachers can make wise instructional choices.

At the curricular level, these three stages are best realized as a fusion of research, best practices, shared and sustained inquiry, consensus building, and initiative that involves all stakeholders. In this design, administrators are instructional leaders who enable the alignment between the curriculum and other key initiatives in their district or schools. These leaders demonstrate a clear purpose and direction for the curriculum within their school or district by providing support for implementation, opportunities for revision through sustained and consistent professional development, initiating action research activities, and collecting and evaluating materials to ensure alignment with the desired results. Intrinsic to the success of curriculum is to show how it aligns with the overarching goals of the district, how the document relates to district, state, or national standards, what a high quality educational program looks like, and what excellent teaching and learning looks like. Within education, success of the educational program is realized through this blend of commitment and organizational direction.

INTENT OF THE GUIDE

This guide is intended to provide teachers with course objectives and possible activities, as well as assist the teacher in planning and delivering instruction in accordance with the New Jersey Core Curriculum Content Standards. The guide is not intended to restrict or limit the teacher's resources or individual instruction techniques. It is expected that the teacher will reflectively adjust and modify instruction and units during the course of normal lessons depending on the varying needs of the class, provided such modified instruction attends to the objectives and essential questions outlined below.

N.J.A.C. 6A:8-3.1 Required Curriculum Components

Code Language	Evident in Curriculum YES/NO	Comments
Interdisciplinary Connections	**Yes**	**STEM units 1 per trimester**
A pacing guide	**Yes**	**By Trimester**
A list of core instructional materials, including various levels of text at each grade level	**Yes**	**Leveled Readers on Science Topics**
Benchmark assessments	**Yes**	**Teacher-developed**
Modifications for special education students, for ELLs in accordance with N.J.A.C. 6A:15, and for gifted students. (As appropriate)	**Yes**	**As directed by student's Individual Education Plan**

Unit Name: Earth Science **Time Frame: 60 days (Trimester 1)**

Author: Egg Harbor Township Public Schools - Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **4th Grade** State/Group: **NJ**

School: **Egg Harbor Township Elementary Schools (Miller, Davenport, Slaybaugh and Swift)**

UNIT SUMMARY:
In this unit of study, students develop understandings of the effects of weathering and the rate of erosion by water, ice, wind, or vegetation. Students will apply their knowledge of natural earth processes to generate and compare multiple solutions to reduce the impacts of the natural earth processes on humans. Students will analyze and interpret data from maps.

UNIT RESOURCES:
Macmillian/McGraw-Hill Science: A Closer Look Grade 4 textbook. Copyright 2011. ISBN: 978-02-287987-7
Lab and activity book, reading and writing resource book, assessment book, school to home activity book, key concept cards, vocabulary cards. (From the Macmillain/McGraw-Hill Science: A Closer Look Grade 4 textbook)

Internet Resource Links: Online textbook, Brainpop.com

https://www.schooltube.com/video/a913dc5d6ab847c8abf3/Bill%20Nye%20Earth's%20Crust

https://www.brainpop.com/science/earthsystem/earthsstructure/

https://www.brainpop.com/science/weather/weathering/

https://www.brainpop.com/science/earthsystem/erosion/

https://www.brainpop.com/science/earthsystem/earthquakes/

https://www.brainpop.com/science/earthsystem/naturaldisasters/

https://www.schooltube.com/video/9522ccca25154ea897ff/Bill%20Nye%20Erosion

https://www.brainpop.com/science/earthsystem/soil/

https://www.schooltube.com/video/139562feb9e84ab1811a/Bill%20Nye%20Fossils

https://www.macmillanmh.com/science/2008/student/na/grade4/g4_ch5.html

https://www.macmillanmh.com/science/2008/student/na/grade4/g4_ch6.html

https://www.brainpop.com/science/diversityoflife/fossils/

https://www.brainpop.com/science/energy/fossilfuels/

http://clearintotheclassroom.com/teachers/stem-lesson-plans/lesson-plan-how-to-make-the-soil-stay-restoring-delta-park/

http://practicalaction.org/wind-power-challenge-stem

STAGE ONE

GOALS AND STANDARDS

4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. [Clarification Statement: Examples of evidence from patterns could include rock layers with marine shell fossils above rock layers with plant fossils and no shells, indicating a change from land to water over time; and, a canyon with different rock layers in the walls and a river in the bottom, indicating that over time a river cut through the rock.] [Assessment Boundary: Assessment does not include specific knowledge of the mechanism of rock formation or memorization of specific rock formations and layers. Assessment is limited to relative time.]

4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. [Clarification Statement: Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.] [Assessment Boundary: Assessment is limited to a single form of weathering or erosion.]

4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features. [Clarification Statement: Maps can include topographic maps of Earth's land and ocean floor, as well as maps of the locations of mountains, continental boundaries, volcanoes, and earthquakes.]

4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. [Clarification Statement: Examples of renewable energy resources could include wind energy, water behind dams, and sunlight; non-renewable energy resources are fossil fuels and fissile materials. Examples of environmental effects could include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution from burning of fossil fuels.]

4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.* [Clarification Statement: Examples of solutions could include designing an earthquake resistant building and improving monitoring of volcanic activity.] [Assessment Boundary: Assessment is limited to earthquakes, floods, tsunamis, and volcanic eruptions.]

ENDURING UNDERSTANDINGS

Students will understand:

- What causes Earth's surface to change?
- What are Earth's resources, and how can we conserve them?

ESSENTIAL QUESTIONS

- What are Earth's features above the ground and below the ground?
- How can Earth's crust change?
- What forces shape and change and Earth's landforms?
- How does weather shape and change the land?
- How does soil differ from place to place?
- What are fossils and fossil fuels?
- How do people obtain and use water?

- How can people reduce pollution and conserve resources?

KNOWLEDGE AND SKILLS
Content covered will be:

Chapter 5: Shaping Earth

- Lesson 1-Earth
- Lesson 2- The Moving Crust
- Lesson 3- Weathering and Erosion
- Lesson 4- Changes Caused by Weather

Chapter 6: Saving Earth's Resources

- Lesson 2- Soil
- Lesson 3- Resources from the Past
- Lesson 4- Water
- Lesson 5- Pollution and Conservation

Skills:

1. Identify Earth's landforms and the features of the ocean floor.
2. Describe the layers of Earth.
3. Describe how the movement of plates builds mountains and causes earthquakes and volcanoes.
4. Explain how scientists use seismic waves to study earthquakes.
5. Define and give examples of physical and chemical weathering.
6. Explain how erosion helps to break down and build up Earth.
7. Describe the effects of floods, fires, tornadoes, and hurricanes.
8. Explain the causes and effects of landslides and avalanches.
9. Describe the different layers of soil and how they form.
10. Define the texture, porosity, and permeability of soil.
11. Describe the different kinds of fossils, the ways they form, and how they provide evidence of Earth's past.
12. Explain why fossil fuels are a valuable and nonrenewable resource.
13. Explain how the water cycle renews Earth's freshwater.
14. Describe ways people use and obtain freshwater.
15. Identify the effects of pollution to land, water, and air.
16. Describe ways to reduce pollution and conserve resources.

STAGE TWO

PERFORMANCE TASKS: Chapter 5 & 6 Explore and Quick Lab activities that are listed in the textbook

- Explore Activity: What shapes can the land take?
- Quick Lab: Drain Away
- Explore Activity: How can Earth's crust change shape?
- Quick Lab: Hearing Clues?
- Explore Activity: How can rain shape the land?
- Quick Lab: Scratch, Scratch
- Explore Activity: How does steepness of slope effect the movement of Earth's materials?

- Quick Lab: Storms at the Beach
- Explore Activity: What is soil made of?
- Quick Lab: Rate of Flow
- Explore Activity: What can you learn from footprints?
- Quick Lab: Older and Younger
- Explore Activity: Does water flow faster through soil or gravel?
- Quick Lab: Fresh Water in Plants
- Explore Activity: How can you clean an oil spill?
- Quick Lab: Conservation Plan

OTHER EVIDENCE: Lesson tests, chapter tests, classroom assignments, STEM activities, and projects

STAGE THREE

LEARNING PLAN
Activities, experiences, and lessons that will lead to the achievement of the desired results and success on assessments are:

- **Chapter 5, Lesson 1-4- Explore Activities, Quick Labs, and Lesson Tests**
- **Chapter 5 Test**
- **Chapter 6, Lessons 2-5- Explore Activities, Quick Labs, and Lesson Tests**
- **Chapter 6 Test**
- **STEM activities and projects**

Unit Name: Physical Science **Time Frame: 60 days (Trimester 2)**

Author: Egg Harbor Township Public Schools - Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **4th Grade** State/Group: **NJ**

School: **Egg Harbor Township Elementary Schools (Miller, Davenport, Slaybaugh and Swift)**

UNIT SUMMARY:
In this unit of study, students will develop an understanding that energy can transfer from place to place by sound, light, heat, and electrical currents. Students will be able to use evidence to construct an explanation of the relationship between the speed of an object and the energy of that object, and are expected to develop an understanding that energy can be transferred from object to object through collisions. Students will use a model of waves to describe patterns of waves in terms of amplitude and wavelength and to show that waves can cause objects to move.

UNIT RESOURCES:
Macmillan/McGraw-Hill Science: A Closer Look Grade 4 Textbook. Copyright 2011, ISBN # 978-0-02-287988-4
Lab and activity book, reading and writing resource book, assessment book, school to home activity book, key concept cards, vocabulary cards (from the Macmillan/McGraw-Hill Science: A Closer Look Grade 4 series)

Internet Resource Links: Online textbook, Brainpop.com
http://www.schooltube.com/video/9c1ea126469b46ffa71f/Bill%20Nye%20Motion

https://www.schooltube.com/video/6036eb0cf2d3431eb090/Bill%20Nye%20-%20Energy

https://www.brainpop.com/science/energy/forces/

https://www.brainpop.com/science/motionsforcesandtime/newtonslawsofmotion/

https://www.brainpop.com/science/energy/potentialenergy/

https://www.brainpop.com/science/energy/kineticenergy/

https://www.brainpop.com/science/energy/heat/

https://www.brainpop.com/science/energy/sound/

https://www.brainpop.com/science/energy/light/

https://www.brainpop.com/science/motionsforcesandtime/magnetism/

http://www.stem4teachers.org/wp-content/uploads/2014/02/Force-and-Motion-RampItUp-final.pdf

https://www.exploratorium.edu/snacks/falling-rhythm

http://buggyandbuddy.com/science-kids-launching-ping-pong-ball-snowmen/

https://www.macmillanmh.com/science/2008/student/na/grade4/g4_ch11.html

https://www.macmillanmh.com/science/2008/student/na/grade4/g4_ch12.html

STAGE ONE

GOALS AND STANDARDS

4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object. [Assessment Boundary: Assessment does not include quantitative measures of changes in the speed of an object or on any precise or quantitative definition of energy.]

4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. [Assessment Boundary: Assessment does not include quantitative measurements of energy.]

4-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide. [Clarification Statement: Emphasis is on the change in the energy due to the change in speed, not on the forces, as objects interact.] [Assessment Boundary: Assessment does not include quantitative measurements of energy.]

4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.* [Clarification Statement: Examples of devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound; and, a passive solar heater that converts light into heat. Examples of constraints could include the materials, cost, or time to design the device.] [Assessment Boundary: Devices should be limited to those that convert motion energy to electric energy or use stored energy to cause motion or produce light or sound.]

4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move. [Clarification Statement: Examples of models could include diagrams, analogies, and physical models using wire to illustrate wavelength and amplitude of waves.] [Assessment Boundary: Assessment does not include interference effects, electromagnetic waves, non-periodic waves, or quantitative models of amplitude and wavelength.]

4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. [Assessment Boundary: Assessment does not include knowledge of specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works.]

4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information.* [Clarification Statement: Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information about a picture, and using Morse code to send text.]

ENDURING UNDERSTANDINGS

Students will understand:

- Why do things move?
- How do we use energy?

ESSENTIAL QUESTIONS

- How do objects move?
- How can pushes and pulls affect the way objects move?
- How are energy and work related?
- How do simple machines make work easier?
- What is heat?
- How can you make sounds?
- How does light behave?
- How does electricity affect your life?
- How are electricity and magnetism related?

KNOWLEDGE AND SKILLS

Content covered will be:

Chapter 11: Forces

- Lesson 1-Motion and Forces
- Lesson 2- Changing Motion
- Lesson 3- Work and Energy
- Lesson 4- Simple Machines

Chapter 12: Energy

- Lesson 1- Heat
- Lesson 2- Sound
- Lesson 3- Light
- Lesson 4- Electricity
- Lesson 5- Magnetism and Electricity
-

Skills:

1. Explain how motion, speed, velocity, and acceleration are related.
2. Summarize the forces that act on a moving object, including friction and gravity.
3. Demonstrate a basic understanding of how forces affect motion.
4. Explain how friction affects motion.
5. Define work and energy.
6. Compare and contrast potential and kinetic energy.
7. Identify the different kinds of simple machines.
8. Explain how simple machines work together to make compound machines.
9. Explain that heat flows from warmer materials to cooler materials.
10. Describe and define conduction, convection, and radiation.
11. Explain how sound is produced and how it travels through a medium.

12. Identify the characteristics of sound, including frequency, pitch, volume, and echoes.
13. Demonstrate that light travels in a straight line.
14. Describe ways light can be absorbed, reflected, or refracted by objects.
15. Describe the characteristics of electrically charged objects.
16. Explain the difference between static and current electricity.
17. Describe a magnetic field and the effect of distance on magnetic force.
18. Understand how an electromagnet, an electric motor, and a generator work.

STAGE TWO

PERFORMANCE TASKS: Chapter 11 & 12 Explore and Quick Lab activities that are listed in the textbook

- Explore Activity: How fast does it move?
- Quick Lab: Inertia and Friction
- Explore Activity: How do forces change motion?
- Quick Lab: Friction and Motion
- Explore Activity: How are position and force related?
- Quick Lab: The Energy of a Pendulum
- Explore Activity: How do pulleys reduce force?
- Quick Lab: Comparing Levers
- Explore Activity: What keeps mammals warm in places with little heat?
- Quick Lab: Temperature and Air
- Explore Activity: How can strings make music?
- Quick Lab: Pitch and Water
- Explore Activity: What makes white light?
- Quick Lab: Angle of Reflection
- Explore Activity: How do rubbed balloons interact?
- Quick Lab: Make a Parallel Circuit
- Explore Activity: How do magnets interact?
- Quick Lab: Make an Electromagnet

OTHER EVIDENCE: Lesson tests, chapter tests, classroom assignments, STEM activities, and projects

STAGE THREE

LEARNING PLAN
Activities, experiences, and lessons that will lead to the achievement of the desired results and success on assessments are:

- **Chapter 11, Lesson 1-4- Explore Activities, Quick Labs, and Lesson Tests**
- **Chapter 11 Test**
- **Chapter 12, Lessons 1-5- Explore Activities, Quick Labs, and Lesson Tests**
- **Chapter 12 Test**
- **STEM activities and projects**

Unit Name: Life Science **Time Frame: 60 days (Trimester 3)**

Author: Egg Harbor Township Public Schools - Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **4th Grade** State/Group: **NJ**

School: **Egg Harbor Township Elementary Schools (Miller, Davenport, Slaybaugh and Swift)**

UNIT SUMMARY:
In this unit, students will develop an understanding that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. Students will also develop an understanding of how organisms process information.

UNIT RESOURCES:
Macmillan/McGraw-Hill Science: A Closer Look Grade 4 textbook. Copyright 2011. ISBN: 978-0-02-287986-0.
Lab and activity book, reading and writing resource book, assessment book, school to home activity book, key concept cards, vocabulary cards. (From the Macmillan/McGraw-Hill Science: A Closer Look Grade 4 textbook)

Internet Resource Links: Online textbook, Brainpop.com

https://www.youtube.com/watch?v=MfopLilIOeA

http://www.schooltube.com/video/f7c3e5bb9bc0881ba287/Bill-Nye-the-Science-Guy-Cells

https://www.brainpop.com/science/cellularlifeandgenetics/cells/

https://www.youtube.com/watch?v=uohe2V4yOzE

https://www.schooltube.com/video/4e10d00215714f48b27b/Bill%20Nye%20Life%20Cycles

https://www.youtube.com/watch?v=d-BEu50zWHE

https://www.macmillanmh.com/science/2008/student/na/grade4/g4_ch1.html

https://www.macmillanmh.com/science/2008/student/na/grade4/g4_ch2.html

http://pagingfunmums.com/2013/07/09/fun-science-experiment-learning-how-plants-absorb-water/

https://www.scholastic.com/teachers/activities/teaching-content/animals-7-studyjams-interactive-science-activities/

STAGE ONE

GOALS AND STANDARDS

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.] [Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.]

4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. [Clarification Statement: Emphasis is on systems of information transfer.] [Assessment Boundary: Assessment does not include the mechanisms by which the brain stores and recalls information or the mechanisms of how sensory receptors function.]

ENDURING UNDERSTANDINGS

Students will understand:

- What are living things and how are they classified?
- How are animals different from one another?

ESSENTIAL QUESTIONS

- How are living things organized?
- How are living things grouped?
- What are plants?
- How do seed plants grow and reproduce?
- How do animals compare?
- Which animals have backbones?
- How do systems help animals survive?
- How do animals grow and reproduce?

KNOWLEDGE AND SKILLS

Content covered will be:

Chapter 1: Kingdoms of Life

- Lesson 1-Cells
- Lesson 2- Classifying Living Things
- Lesson 3- The Plant Kingdom
- Lesson 4- How Seed Plants Reproduce

Chapter 2: The Animal Kingdom

- Lesson 1- Animals Without Backbones
- Lesson 2- Animals with Backbones
- Lesson 3- Systems in Animals
- Lesson 4- Animal Life Cycles

Skills:

1. Summarize five functions of living things.
2. Compare plant and animal cells.
3. Define and compare the kingdoms of living things.
4. Describe different types of microorganisms.
5. Describe the functions of roots, stems, and leaves.
6. Explain the processes of photosynthesis and respiration.
7. Describe pollination in flowering plants.
8. Explain the life cycle of a flowering plant.
9. Define animal and list the basic needs and characteristics of animals.
10. Summarize the characteristics of groups of invertebrates.
11. Define vertebrates and describe their characteristics.
12. Describe the seven groups of vertebrates.
13. Identify seven organ systems of animals.
14. Summarize the structures and functions of the seven organ systems.
15. Compare incomplete metamorphosis to complete metamorphosis.
16. Summarize how traits are passed from parent to offspring.

STAGE TWO

PERFORMANCE TASKS: Chapter 1 & 2 Explore and Quick Lab activities that are listed in the textbook.

- Explore Activity: What are living things made of?
- Quick Lab: Cells, Tissues, and Organs
- Explore Activity: How are Organisms classified?
- Quick Lab: Observe a One-Celled Organism
- Explore Activity: How are leaves different from each other?
- Quick Lab: How do Mosses get Water?
- Explore Activity: Does a seed need water to grow?
- Quick Lab: Make a Seed Model
- Explore Activity: What makes an earthworm an animal?
- Quick Lab: How jellyfish move
- Explore Activity: What does a backbone do?
- Quick Lab: How Birds Fly
- Explore Activity: How does an earthworm respond to light?
- Quick Lab: Make a Model Lung
- Explore Activity: How does a caterpillar change as it grows?
- Quick Lab: Animal Cards

OTHER EVIDENCE: Lesson tests, chapter tests, classroom assignments, STEM activities, and projects

STAGE THREE

LEARNING PLAN
Activities, experiences, and lessons that will lead to the achievement of the desired results and success on assessments are:

- **Chapter 1, Lesson 1-4- Explore Activities, Quick Labs, and Lesson Tests**
- **Chapter 1 Test**
- **Chapter 2, Lessons 1-4- Explore Activities, Quick Labs, and Lesson Tests**
- **Chapter 2 Test**
- **STEM activities and projects**

Unit Name: Earth Systems, Energy Flow, and Interactions

Time Frame: 60-80 days Trimester 1 (may go into Trimester 2)

Author: Egg Harbor Township Public Schools - Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **5th Grade** State/Group: **NJ**

School: **Miller**

UNIT SUMMARY

This unit will cover the ways energy in our ecosystems flows. Specifically, Earth's three major cycles (Water, Carbon, Nitrogen) and four spheres (Geo, Bio, Hydro, Atmo). We will also cover human impact on Earth's resources; both positive and negative.

UNIT RESOURCES

Science: A Closer Look (Macmillan/McGraw-Hill ISBN 978-0-02-288009-5): Chapter 3 Lesson 1, Chapter 4 Lessons 1 and 4, Chapter 6 Lesson 2 and 4, Chapter 7 Lessons 1 and 4.

Internet Resource Links:

http://www.rakisradresources.com/2014/08/top-10-science-websites-for-elementary.html

http://www.bbc.co.uk/bitesize/ks2/science/living_things/

STAGE ONE

GOALS AND STANDARDS

5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. [Clarification Statement: Examples of models could include diagrams, and flow charts.]

5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water. [Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.]

5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. [Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.]

5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. [Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.] [Assessment Boundary: Assessment is limited to the interactions of two systems at a time.]

5-ESS2-2. Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. [Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.]

5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

ENDURING UNDERSTANDINGS

All energy in our ecosystems start with the Sun and then flows through all of Earth's cycles.
The other resources of the Earth need to be protected and conserved.

ESSENTIAL QUESTIONS

How can models be used to display the path energy takes through an ecosystem?
How do cycles model the movement of matter through an ecosystem?
How can you model interactions between the geosphere, biosphere, hydrosphere, or atmosphere?
Why is it important for communities to protect the Earth's resources?

KNOWLEDGE AND SKILLS

Students will know:

- The major cycles of Earth. (Water, Carbon, Nitrogen)
- The Sun's energy is a vital component to all of Earth's systems and cycles.
- Matter, in the form of food, moves through an ecosystem and energy is wasted at each step along the chain.
- Geosphere = the layers of the Earth (rock), Biosphere =The parts of the Earth where living things are found, Hydrosphere = Earth's liquid and solid water, Atmosphere = Earth's layer of gases.
- People are a major cause of pollution (air, water, soil). People can be a major part of the solution.

Students will be able to:

- Track a water molecule through the water cycle.
- Calculate the remaining energy at various points in a food chain.
- Make changes in their community that result in a positive impact on the environment.
- Differentiate between producers, consumers, and decomposers and identify local examples of each.
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STAGE TWO

PERFORMANCE TASKS

Students will design models of the cycles. (Water, Carbon, Nitrogen)
Students will design models detailing one of Earth's spheres. (example: a model of the layers of the atmosphere)

OTHER EVIDENCE

Students will take Lesson assessments and a cumulative Unit assessment. (Edulastic)

STAGE THREE

LEARNING PLAN

Students will read and discuss the following lessons:

3-1 Energy Flow in Ecosystems
- Text p.140-153
- Reading and Writing p.56-63

4-1 Cycles in Ecosystems
- Text p.182-193
- Reading and Writing p.75-78

4-4 Water Ecosystems
- Text p.218-229
- Reading and Writing p.89-94

6-2 Soil (Conservation)
- Text p.314-323
- Reading and Writing p.132-135

6-4 Air and Water (Conservation)
- Text p.340-353
- Reading and Writing p.142-147

7-1 The Atmosphere and Weather
- Text p.362-377
- Reading and Writing p.152-155

7-4 Climate
- Text p.406-415
- Reading and Writing p.166-171

General activities:
Students will keep a weather diary.
Students will design models of a food chain.
Students will construct a leaf pack to test water purity of nearby bodies of water.

Activity Lab Book

Chapter 3

How do organisms in a food chain interact? p.64-66
What do organisms need to survive? p.69-71

Chapter 4

How do water droplets form? p.82-84
Salt Water vs. Fresh Water. p.108

Chapter 6

Which soil is better for plant growth? p.154-155
What effect does pollution have on plants? p.156-157

Chapter 7

How does the angle of sunlight affect temperature? p.168-170
How much rain falls in your community? p.176-177
How does distance from an ocean affect temperature? p. 190-192

Unit Name: Earth's Place in the Universe

Time Frame: 40-60 days Trimester 2

Author: Egg Harbor Township Public Schools - Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **5th Grade**

State/Group: **NJ**

School: **Miller**

UNIT SUMMARY

The position of the Earth in the Universe impacts the planet in a variety of ways. The stars and constellations we observe from the Earth change as that position changes.

UNIT RESOURCES

Science: A Closer Look (Macmillan/McGraw-Hill ISBN 978-0-02-288009-5): Chapter 8 Lesson 1 and 4, A Closer Look Chapter 12 Lesson 3

Internet Resource Links:

http://www.rakisradresources.com/2014/08/top-10-science-websites-for-elementary.html

https://www.nasa.gov/audience/foreducators/5-8/index.html

http://www.bbc.co.uk/bitesize/ks2/science/physical_processes/

http://interactivesites.weebly.com/constellations.html

STAGE ONE

GOALS AND STANDARDS

5-ESS1-1. Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. [Assessment Boundary: Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, stage).]

5-ESS1-2. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. [Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.] [Assessment Boundary: Assessment does not include causes of seasons.]

5-PS2-1. Support an argument that the gravitational force exerted by Earth on objects is directed down. [Clarification Statement: "Down" is a local description of the direction that points toward the center of the spherical Earth.] [Assessment Boundary: Assessment does not include mathematical representation of gravitational force.]

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

ENDURING UNDERSTANDINGS

Students will understand that Earth's position in relation to the Sun affects climate, shadows, and the night sky.

ESSENTIAL QUESTIONS

What role does gravity play in our universe?
How does distance from the Sun and the angles of the light affect the Earth?

KNOWLEDGE AND SKILLS

Students will know:

- Light travels at incredible speeds. Nothing we know of travels faster
- A shadow is created when light is blocked.
- Gravity pulls all objects towards a center of mass.
- The strength of gravity determines weight, has no effect on mass.
- The angle of the sun is responsible for the length of shadows.
- Constellations that are visible in each hemisphere change with the seasons throughout the year.
- Objects in the night sky appear closer together than they really are.
- The Earth rotates on its axis and revolves around the Sun.

Students will be able to:

- Predict/Explain how/why shadows change.
- Identify and name major constellations.
- Demonstrate the motions of our planet in relation to the Sun.

STAGE TWO

PERFORMANCE TASKS

Students will use coordinates to model a constellation of their choice on grid paper.

Conduct research on a location. Determine how the change of seasons (Caused by the revolution of the Earth) impact this location throughout one year. Organize the information into a travel brochure.

OTHER EVIDENCE

Students will take Lesson assessments and a cumulative Unit assessment. (Edulastic)

STAGE THREE

LEARNING PLAN

Students will read and discuss the following lessons:

Chapter 12 Lesson 3 – Light
- Text p.650-663
- Reading and Writing p. 271-276

Chapter 8 Lesson 1 – Earth and Sun
- Text p. 418-429
- Reading and Writing p. 175-178

Chapter 8 Lesson 4 – Stars and the Universe
- Text p.456-469
- Reading and Writing p. 191-195

Predict which object will fall faster, taking into account air resistance and the object's mass and shape. Create shadow chalk outlines on the blacktop throughout the day as the angle of the Sunlight changes. Research the history/myth behind a constellation of choice. Present the information to the class.

Activity Lab Book

Chapter 8
- How does distance affect how bright a star looks? p.213-215

Unit Name: Properties of Matter and Chemical Reactions

Time Frame: 60 Days Trimester 3

Author: Egg Harbor Township Public Schools - Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **5th Grade**

State/Group: **NJ**

School: **Miller**

UNIT SUMMARY

Matter makes up everything. Its properties affect how it acts and reacts. Physical and Chemical changes occur all around us.

UNIT RESOURCES

Science: A Closer Look (Macmillan/McGraw-Hill ISBN 978-0-02-288009-5): Chapter 9 Lessons 1 and 2, Chapter 10 Lessons 1,2, and 3.

Internet Resource Links:

http://www.rakisradresources.com/2014/08/top-10-science-websites-for-elementary.html

http://www.bbc.co.uk/bitesize/ks2/science/materials/

STAGE ONE

GOALS AND STANDARDS

5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.
[Clarification Statement: Examples of evidence supporting a model could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.] [Assessment Boundary: Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.]

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.
[Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that form new substances.] [Assessment Boundary: Assessment does not include distinguishing mass and weight.]

5-PS1-3. Make observations and measurements to identify materials based on their properties.
[Clarification Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] [Assessment Boundary: Assessment does not include density or distinguishing mass and weight.]

5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

ENDURING UNDERSTANDINGS

Students will understand that the specific properties of matter affect the way it will act/react.

ESSENTIAL QUESTIONS

How can you describe matter in all of its states?

Why is knowing matter's specific properties important?

How does matter change when energy is added or removed?

KNOWLEDGE AND SKILLS

Students will know:

- The phases of matter.
- Everything is made of matter. Matter is made up of atoms. Atoms are made up of Protons, Neutrons, and Electrons.
- Matter cannot be created of destroyed, only changed.
- Matter has density.
- Matter changes its phase when energy is added or removed.
- Physical changes do not change the type of matter. Chemical changes create new substances.
- A compound is made of two of more elements.

Students will be able to:

- Design a diagram/model of an atom, element, and compound.
- Determine what elements are part of a compound.
- Classify matter based on its properties.
- Differentiate between physical and chemical changes. (Show examples of)

STAGE TWO

PERFORMANCE TASKS

Design models of atoms, elements, and compounds.

OTHER EVIDENCE

Students will take Lesson assessments and a cumulative Unit assessment. (Edulastic)

STAGE THREE

LEARNING PLAN

Students will read and discuss the following lessons:

9-1 Properties of Matter
- Text p.478-487
- Reading and Writing p. 199-202

9-2 Elements
- Text p.488-501
- Reading and Writing p. 203-208

10-1 Changes of State
- Text p.518-527
- Reading and Writing p. 216-219

10-2 Mixtures
- Text p.528-239
- Reading and Writing p. 220-223

10-3 Compounds and Chemical Changes
- Text p.540-551
- Reading and Writing p. 224-229

Make lemonade using powder to observe how it dissolves in water at different temperatures.
Melt crayons on a hot plate to test/observe how the color changes, tying in our past lesson on Light.
Predict and test whether an object floats. Devise a way to dense objects to float or buoyant object to sink.
Design a boat out of common classroom items (foil, paper, tape, popsicle sticks, straws, toothpicks, etc.). Test to see if it floats and how much weight it can hold.
Create ice-cream by using salt and ice to rapidly freeze a milk/sugar mixture.

Activity Lab Book

Chapter 10
- How can you speed up mixing? p.252-254
- How can you separate mixtures? p.257-258
- Does mass change in a chemical change? p.261-263
- Chemical Cents. p.265

Curriculum Resources - Differentiated Instruction

Special Education Interventions in General Education

Visual Supports
Extended time to complete tests and assignments
Graphic Organizers
Mnemonic tricks to improve memory
Study guides
Use agenda book for assignments
Provide a posted daily schedule
Use of classroom behavior management system
Use prompts and model directions
Use task analysis to break down activities and lessons into each individual step needed to complete the task
Use concrete examples to teach concepts
Have student repeat/rephrase written directions
Heterogeneous grouping

Resources:

Do to Learn:
http://www.do2learn.com/

Sen Teacher:
http://www.senteacher.org/

Intervention Central:
http://www.interventioncentral.org/

Learning Ally:
https://www.learningally.org/

English Language Learners Interventions in Regular Education
Resources:

FABRIC - Learning Paradigm for ELLs (NJDOE)
www.nj.gov/education/bilingual/pd/**fabric**/**fabric**.pdf

Guide to Teaching ELL Students
http://www.colorincolorado.org/new-teaching-ells

Edutopia - Supporting English Language Learners
https://www.edutopia.org/blog/strategies-and-resources-supporting-ell-todd-finley

Reading Rockets
http://www.readingrockets.org/reading-topics/english-language-learners

Gifted and Talented Interventions in Regular Education
Resources:

Who are Gifted and Talented Students

http://www.npr.org/sections/ed/2015/09/28/443193523/who-are-the-gifted-and-talented-and-what-do-they-need

Hoagies Gifted Education Page
http://www.hoagiesgifted.org/programs.htm

21st Century Learning
Resources:

Partnership for 21st Century Learning
http://www.p21.org/

Career Ready Practices (NJDOE)
http://www.nj.gov/education/cte/hl/CRP.pdf