Unit 3 Overview
Unit Title: **Earth Systems**
Grade Level: **5**
Recommended Pacing: 3 months; block scheduling
Unit Summary: Suppose you live on an island. On a warm day, you and your family decide to go snorkeling. When you get to the beach, you breathe in the fresh ocean air. Underwater, you see fish swimming and crabs crawling across the sand. You also observe sea grass and coral reefs along the ocean floor. In this unit, you will learn how all of these things are part of systems that make up Earth, and how these systems interact in different ways.
Unit 3 NGSS: 5-ESS2. Earth's Systems 5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. 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. 5-ESS3. Earth and Human Activity 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. Engineering Design

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.

CCSS:ELA

- RI.5.3 Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

- RI.5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

- W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

- W.5.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

CCSS:Mathematics

- 5.MD.B.2 Make a line plot to display a data set of measurements in fractions of a unit. Use operations on fractions for the grade to solve problems involving information presented in line plots.

- 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.

Unit 3 ISTE Standards:

1. a-d Creativity and Innovation- Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes through technology.

2. a-d 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.

3. a-d Research and Information Fluency- Students apply digital tools to gather, evaluate, and use information.

4. a-d Critical Thinking, Problem Solving, and Decision Making- Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

Science and Engineering Practices:

- Developing and Using Models
- Develop a model using an example to describe a scientific principle.
- Using Mathematics and Computational Thinking
- Describe and graph quantities such as area and volume to address scientific questions
- Obtaining, Evaluating, and Communicating Information
- Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.

- Use a model to test cause and effect relationships of interactions concerning the functioning of a natural or designed system.
- Asking Questions and Defining Problems
- Define a simple solution that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.
- People's needs and wants change over time, as do their demands for new and improved technologies.

Unit 3 Essential Questions:

- What are Earth's four systems?
- How do Earth's systems produce weather and climate?
- How do Earth's systems change Earth's surface?
- How do farming and industry affect Earth's systems?
- How do people's everyday lives affect Earth's systems?
- What can people do to protect Earth's systems?

Unit 3 Learning Targets ***Students will be able to…***	**Unit 3 Learning Targets** ***Students will do…***
• develop a model, using a specific given example of a phenomenon, to describe ways that the geosphere, biosphere, hydrosphere, and/or atmosphere interact	• read for content mastery

● identify and describe relationships within and between the parts of the Earth systems identified in the model that are relevant to the example ● use their model to describe a variety of ways in which the parts of two major Earth systems in the specific given example interact to affect the Earth's surface materials and processes in that context ● graph and analyze the given data about the amount of salt water and the amount of fresh water in various reservoirs ● obtain information from books and other reliable media about human and community activities regarding their effects on the Earth's resources and environments ● combine information from two or more sources to provide and describe evidence about positive and negative effects on the environment as a result of human activities; and how communities can protect a natural resource and the environment in which the resource is found	● develop and use content related vocabulary ● analyze and interpret data to determine similarities and differences in findings ● cite specific textual evidence to support analysis of science and technical texts ● complete a variety of laboratory activities to support the content ● write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content ● view various content related videos

Unit 3 Evidence of Learning
Formative Assessments: ● Associated quizzes ● Exit tickets ● Lab and engineering based projects ● Reading Challenges ● Interactive Student notebook ● Homework ● BrainPOP quizzes ● Participation: individual/group
Summative Assessments: ● Associated Chapter tests and quizzes ● Labs and engineering based projects ● Create an *act-it-out* to model how Earth's systems interact to cause a change in Earth's surface - (textbook)
Unit 3 Lab Activities: ● Bring Science Alive! - Grade 5 ➔ build a clay model of Earth showing each of its systems ➔ model the effects the mining industry has on the geosphere

➔ act as engineers to design and build a water filter/research

- Gizmos labs: Rock Cycle, Water Cycle, Greenhouse Effect, Coastal Winds & Clouds, Hurricane Motion, Water Pollution
- Lesson: Ratio of water on Earth - A Drop in the Bucket www.extension.usu.edu/waterquality
- Develop a model using an example of the ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact http://climatekids.nasa.gov/next-generation-standards/review//
- Learn about the percentage of fresh drinking water - http://www.earthsciweek.org/classroom-activities/groundwater-movement
- Video and information about the heat capacity of ocean and salt water: http://climatekids.nasa.gov/ocean/
- Water cycle interactive simulation (stations) game - www.srh.noaa.gov/jetstream/atmos/ll-whatacycle.html
- Earth Systems digital lab: www.eduweb.com/portfolio/earthsystems
- Information and table of global water distribution: http://water.usgs.gov/edu/earthwherewater.html
- Design a water filtration system: http://www.earthsciweek.org/classroom-activities/water-filteration

Unit 3 Materials/Equipment:
Required Lab Materials: bags (plastic sandwich size, beads, clay (modeling), cotton balls, Earth Model (inflatable), plates (paper), sand, cups (paper), forks (plastic), knives (plastic), spoons(plastic), paper clips(large), toothpicks, beakers(250mL), bins (plastic), filters (coffee), gravel, sand gravel, soil gravel, sponges, safety glasses, colored pencils, chocolate chip cookies, paper towels, small rocks, water bottles with plastic caps, blue food coloring, meter sticks, markers, 5 gallon water container, globe or map of world
Materials/Equipment/Resources: ● Gizmos subscription ● Quizlet subscription ● BrainPOP subscription ● Teachers Domain video clips ● Mr. Parr's science songs ● TCI Bringing Science Alive Grade 5 series ● Smart Board, student chromebooks ● Scholastic Study Jams videos/activities