**Marietta City Schools**

# District Unit Planner

*Grade 4 Science*

| **Theme** | *Unit 4 Role of Organisms and Flow of Energy Planner* | **Unit duration** | *7 weeks* |
|---|---|---|---|

**Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?***

## GaDoE Standards/3D Science Elements

Georgia Standards:

**S4L1. Obtain, evaluate, and communicate information about the roles of organisms and the flow of energy within an ecosystem.**

a. Develop a model to describe the roles of producers, consumers, and decomposers in a community. (Clarification statement: Students are not expected to identify the different types of consumers – herbivores, carnivores, omnivores and scavengers.)

b. Develop simple models to illustrate the flow of energy through a food web/food chain beginning with sunlight and including producers, consumers, and decomposers.

c. Design a scenario to demonstrate the effect of a change on an ecosystem. (Clarification statement: Include living and nonliving factors in the scenario.)

d. Use printed and digital data to develop a model illustrating and describing changes to the flow of energy in an ecosystem when plants or animals become scarce, extinct or overabundant.

**Unit Objectives:**

- develop a model of a food chain
- explain the roles of producers, consumers, and decomposers in an ecosystem
- develop a model of a food web
- imagine and design an ecosystem where something is taken away or added

**Unit Phenomena**: Show a brief clip (STOP at 40 seconds) video about wolves being introduced back into Yellowstone Park. After watching the clip, ask students to notice and wonder. Record their ideas on a T-chart. Refer to the chart throughout the unit.

**Page Keeley Probes:** Page Keeley probes can be used as phenomena. They are intended to elicit student understanding about science concepts. Starting a unit or lesson with a probe will help you uncover misconceptions and see what students already know about a topic. Using a probe at the beginning of a lesson and then at the end of the lesson serves the purposes of

pretesting and then formatively evaluating student thinking. **Below is a list of probes from Page Keeley's book Uncovering Student Ideas in Science, that are appropriate for this unit.** This book has been purchased for your grade level by the Office of Academic Achievement and can be found in your media center.

**Rotting Apple** (Volume 3)

**Earth's Mass** (Volume 3)

| **Science & Engineering Practices:** | **Disciplinary Core Ideas:** | **Crosscutting Concepts:** |
|---|---|---|
| • Asking questions and defining problems<br>• Developing and using models<br>• Construct explanations and design solutions<br>• Obtaining, evaluating, and communicating | ● Ecosystems<br>● Food chains/ webs<br>● Changes impacting ecosystems<br>● Scarcity, extinction, overabundance | • Energy and Matter<br>• Structure and Function |

**Misconceptions:**

Plants and animals don't need each other for survival.
Adaptations and camouflage prevent some animals and plants from becoming food.
Extinction only occurred in the days of dinosaurs.
Plants and animals can change features to adapt.

**Math/ELA Connections/STEM Connections**

**ELAGSE4RI3:** Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

**ELAGSE4RI4:** Determine the meaning of general academic language and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.

**ELAGSE4RI7:** Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, timelines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

**ELAGSE4RI10:** By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4-5 text complexity band proficiently, with scaffolding as needed at the high end of the range.

**ELAGSE4W2:** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

**ELAGSE4W4:** Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

**ELAGSE4W7:** Conduct short research projects that build knowledge through investigation of different aspects of a topic.

**MGSE4.MD.4** Make a line plot to display a data set of measurements in fractions of a unit (1 2 , 1 4 , 1 8 ). Solve problems involving addition and subtraction of fractions with common denominators by using information presented in line plots. For example, from a line plot, find and interpret the difference in length between the longest and shortest specimens in an insect collection.

STEM:

Dinner at the Reef STEM Project
SIEMENS STEM Activities

**Discovery Education Science Techbook** – (Log into your DE account using your Google credentials to access DE links) You will find station rotation activities such as leveled reading passages, interactives, hands-on labs, virtual labs, video clips, and more on the **Explore** page in each Techbook unit.

Parts of Ecosystems Interactions in Ecosystems Population Changes
Short-Term Changes in Ecosystems
Georgia Forestry Virtual Field Trip – students will learn about different food chains and food webs in this virtual field trip.
Exploring Ecosystems
Interactions in Ecosystems
Coral Reef
Population Changes
Short-Term Changes

**Hands-on Activities**
Food Web Game
Hands-On Activity: Modeling the Flow of Energy and Matter in an Ecosystem
Hands-On Lab: Hazards at Home
Hands-On Activity: In a Food Web
Hands-On Activity: Living or Nonliving
Hands-On Activity: Examine an Environment
Hands-On Activity: Cleaning Product Claims – Fact or Fiction?
Learning to Use Scientific Tools: Cameras and Sound Recorders
Hands-On Activity: Acid Rain

Create a Food Chain/Web
Take students on a discovery walk around the campus. Have them record a list in their notebooks of every living organism they discover. When back in the classroom, have the students create cards for each organism (either the name of the organism or a picture). Have each student create a food chain, including the sun, a producer, and a consumer. Next, put students in small groups and combine their food chains into a food web. Have students record webs in their notebooks.

Below is a list of activities from the **AIMS 4th Grade Georgia Life Science Book:** (most schools have a hard copy or digital version of this book in your building). Contact your Instructional Coach or Science Coordinator if you do not have access to the AIMS books.
The Critter Connection
The Part Plants Play
Producing a Producer

From Leaf to Soil
Dirt Dwellers
Decomposition Ditty
Chain Games
Food Chain
Life in the Food Chain

**Essential Questions**

**Factual—**

1. What role does sunlight and plants have in the flow of energy?
2. What factors affect a change in an ecosystem?

**Inferential—**

1. Develop a model to describe the roles of producers, consumers, and decomposers in a community.

**Critical Thinking-**

1. How is the flow of energy in our local ecosystems threatened?
2. What can we do to support the sustainability of local ecosystems?

| **Tier II Words-** High Frequency Multiple Meaning | **Tier III Words-** Subject/ Content Related Words |
|---|---|
| Plants, animals, energy, food, web, survive, flow | consumer, producer, decomposer, ecosystem, food chain, food web, scarce, extinct, overabundant, keystone species |

| Objective or Content | Learning Experiences | Differentiation Considerations |
|---|---|---|
| **CLE 1-3:**<br>S4L1. Obtain, evaluate, and communicate information about the roles of organisms and the flow of energy within an ecosystem. | Bake the Cake and Eat It Too GaDOE Instructional Segment<br>Students will find out about the roles of organisms and flow of energy in ecosystems by modeling food chains and food webs. They will work with scenarios depicting changes in the ecosystem that impact the organisms living there.<br><br>Role of Organisms and Flow of Energy Model Lesson<br>Students will demonstrate the flow of energy throughout a food web, explain what happens when you add to or take away from a system and develop a model for a food web. | Student Choice Performance Tasks<br>Reflection and Goal Setting<br>Learning Stations<br>Choice Boards<br>Formative Probes<br>Science Journaling<br>Multi-sensory activities<br>Assistive Technology<br>Flexible Grouping<br>Multiple Means of Representation |
| **Recommended High Quality Complex Text By Lexile Band** | | |
| What are Food Chains and Webs By Bobbie Kalman<br>Real World Science: Ecosystems By Stephen Currie<br>Life in Ponds By Lauren Coss<br>Food Chains and You By Bobbie Kalman<br>Real World Science: Protecting Ecosystems By Leanne McGhee<br>Photosynthesis: Changing Sunlight into Food By Bobbie Kalman | | |