This unit has been created as an exemplary model for teachers in (re)design of course curricula. An exemplary model unit has undergone a rigorous peer review and jurying process to ensure alignment to selected Delaware Content Standards.

Unit Title: Ecosystems

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Content Area: Social Studies
Grade Level: 5

Summary of Unit

“The relationship between human needs and the natural environment is fundamental to life. Humans modify the environment in culturally distinctive ways as they respond to the resource opportunities and risks present in the physical world. To understand this relationship, students must know of the major processes which shape the world into distinctive physical environments, and gain awareness of the opportunities and limitations to human action presented by those environments.”

-- Understanding the Geography Standards;
Peter W. Rees

This unit is intended to develop geographic perspectives of ecosystems and will be most effective if taught concurrently with the DRC Science unit, Ecosystems. Students will apply environmental relationships they have been learning about in the science program as they observe and analyze examples of ecosystems in landscapes found locally, regionally, and in other parts of the United States. Activities and materials in this unit will also extend and reinforce knowledge of the basic geography of Delaware and the United States. The interdependence of living things and the effects of human activities on ecosystems are the primary emphasis. As part of this unit, students will be utilizing Fieldscope, a web based mapping, analysis, and collaboration tool.

This unit assumes a basic knowledge of types of landforms and climate and the basic forces that cause these characteristics of the physical environment.

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Delaware Social Studies Standards

- **Geography Standard Two 4-5a:** Students will apply a knowledge of topography, climate, soils, and vegetation of Delaware and the United States to understand how human society alters, and is affected by, the physical environment.

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

<table>
<thead>
<tr>
<th>KNOW:</th>
<th>UNDERSTAND:</th>
<th>DO:</th>
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<tbody>
<tr>
<td>Unique characteristics of the topography, climate, soil, and vegetation of Delaware.</td>
<td>Physical environments found in different parts of Delaware and the United States support a variety of ecosystems.</td>
<td>Gather information from maps, photos and text to build a knowledge of ecosystems of Delaware.</td>
</tr>
<tr>
<td>Characteristics and location of typical ecosystems found in Delaware.</td>
<td>The physical environment affects human activities.</td>
<td>Gather information from maps, photos and text to build knowledge of the environment and problems facing the Chesapeake Bay &amp; other key watersheds found in the U.S.</td>
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<tr>
<td>Characteristics and location of the Chesapeake Watershed and other key watersheds in the U.S.</td>
<td>Human activity alters or impacts the physical environment.</td>
<td>Use deductive reasoning to determine how humans are affecting the environment.</td>
</tr>
<tr>
<td>Similarities of Delaware, Chesapeake Watershed, other U.S. watersheds.</td>
<td></td>
<td>Observe, record, and analyze data in order to draw conclusions.</td>
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<tr>
<td>Differences of Delaware, Chesapeake Watershed, other U.S. watersheds.</td>
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<tr>
<td>Human society adapts to and alters the environment locally, regionally, and nationally.</td>
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This summative assessment is a transfer task that requires students to use knowledge and understandings to perform a task in a new setting and context. The assessment and scoring guide should be reviewed with students prior to any instruction. Students should do the assessment after the lessons conclude.

**Essential Question Measured by the Transfer Task**
- How does human society alter and affect the physical environment?

<table>
<thead>
<tr>
<th>Prior Knowledge</th>
<th>Now that you have learned how humans affect and are affected by the natural environment of a place, it is time to demonstrate your understanding of this relationship.</th>
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<tbody>
<tr>
<td>Problem</td>
<td>Students in other parts of the Chesapeake Watershed region want to know more about the part of the watershed that is in Delaware.</td>
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<tr>
<td>Role/ Perspective</td>
<td>As a student geographer, you are asked to gather, organize and analyze information about the physical conditions and living organisms that make up the ecosystem in one location of the watershed and the ways humans have affected the ecosystems</td>
</tr>
<tr>
<td>Product/ Performance</td>
<td>Using your field notes and evidence you have gathered, you will: 1) Complete a field observation form for the FieldScope mapping system. Select up to three photos to represent your observations and explain why they are good representations of physical features and conditions, living aspects of the ecosystem, and human adaptations. 2) Write a short article for a student newspaper comparing the ecosystem you observed in the field with two other locations in the Chesapeake Bay watershed. Use the FieldScope dataset and the maps provided to support your comparison.</td>
</tr>
<tr>
<td>Criteria for an Exemplary Response</td>
<td>To be successful, your data entry form and photo selection must meet the criteria of the FieldScope system. Your article should include a comparison of the topography, climate, soils and vegetation of the two sites with your own field observation.</td>
</tr>
</tbody>
</table>
Lesson 1: Locating Ecosystems

Essential Questions
- How might differences in physical environments result in diverse ecosystems in Delaware and the United States?
- How might mapped patterns in physical environments predict patterns in ecosystems?

Materials Needed
Copies of outline maps of the Delmarva and Chesapeake Bay Watershed, highlighters in four colors, copies of student readings

Instructional Strategies

Strategy 1: Gathering Information
Mapped Patterns

This activity will introduce the idea that physical conditions determine what plants and animals can thrive and interact in an area to form an ecosystem. Students will compare public use areas along the shoreline of the region to see that slight differences in topography, salinity, wave and water action, and soils contribute to quite different landscapes and support different ecosystems.

To recall earlier learning and provide orientation, have students locate the Delmarva Peninsula on a satellite view of the United States and identify the approximate area of the state of Delaware. (This can be accomplished electronically or with paper maps.) Point out the locations of the Appalachian Mountains and Rocky Mountains, the Mississippi River and the Great Lakes. Remind the students that Delaware and the Delmarva Peninsula are on the Atlantic Coastal Plain.¹

Have the students label an outline map of the Delmarva Peninsula and Chesapeake Watershed with names of bodies of water (Atlantic Ocean, Delaware Bay, Chesapeake Bay, Inland bays) and names of states in the region (Delaware Maryland, Virginia, Pennsylvania, New York, and West Virginia, and the District of Columbia).

Explain that students will be relating what they learn about ecosystems to a variety of places in our state and in the Chesapeake Bay Watershed region. Tell the students that what they learn about local ecosystems can be applied to other areas of the United States and even the world.

¹ These locations and others are expected from students in the 4th grade DRC unit, Developing Mental Maps.
**Strategy 2: Extending and Refining**

**Mapped Patterns and Graphic Organizer**

Have students return to the map they labeled *(Delmarva Peninsula and Chesapeake Bay Watershed).*

Distribute highlighters in four colors. Have the students use a different color to highlight four coastal areas: the Atlantic Coast of the Delmarva Peninsula, the Delaware Bay coastline, the eastern shore of the Chesapeake Bay, and the western shoreline of the Chesapeake. Distribute *Shorelines of the Chesapeake Bay and Delmarva.*

Have students read the articles about the parks and public areas. As they read, they should complete the graphic organizer, *Thinking Like a Geographer.* Next, have the students look at the map of the Delmarva and Chesapeake Bay Shorelines. Questions are included to help guide their thinking.

**Check for Understanding**

Hurricanes are large coastal storms that bring high winds, large waves and a storm surge that can cause widespread flooding near coastlines. Select one of the shoreline parks.

- How might the ecosystems there be affected by a hurricane? Explain your answer.

**Rubric**

2 – This response gives a valid effect with an accurate and relevant explanation.

1 – This response gives a valid effect with an inaccurate, irrelevant, or no explanation.

**Strategy 3: Application**

**Comparing Ecosystems**

Shoreline ecosystems are varied, but they have many similar characteristics. Delaware is a small state, yet it includes at least six main types of ecosystems, each with its own set of physical conditions and living organisms.

Each ecosystem produces a recognizable landscape. Distribute *Six Ecosystems You Should Know.* Review with students the types of ecosystems, including the living elements and the thumbnail photos that illustrate the landscape.

Have the students answer the questions related to Delaware ecosystems and label the Delaware map with likely locations for each ecosystem type.

**Click here for the Check for Understanding.**

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2 The lexile score for this reading is 1040, appropriate for the upper level of the Common Core State Standards 4-5 grade cluster.
Lesson Two

Essential Question

• How have people adapted to or altered ecosystems?

Instructional Strategies

Strategy 1: Gathering Information

Think/Pair/Square³

Have students work in pairs to respond to this question:
• When people move from one place to another, what are some things they might have to adapt to?
• Sample responses: climate differences, availability of stores and services, language, local laws and regulations, etc.

Give each individual student about one minute to think about an answer or solution on their own. The student then pairs up with another student to compare answers, then join another pair to compare answers.

Ask the group of four students to share their findings. Tell the students that this lesson will be about ways people have adapted to and, most importantly, altered the natural environment. Because people are part of ecosystems, the changes people make to the environment impact other parts of the ecosystem.

Strategy 2: Extending and Refining

Timed Pair Paraphrase⁴

This strategy has students paired to read and complete a graphic organizer for the purpose of answering a question. Have students read People and Ecosystems⁵ and use the graphic organizer to assist in comprehension.

Select one student to go first. Tell that student “explain how people have adapted to or altered ecosystems. You have two minutes. If you stop sharing, your partner should ask questions.”

³ This activity is built on the foundation of Think-Pair-Share without the class reporting. After Think-Pair-Share takes place, partners team up with another set of partners, creating groups of four students. Each group compares the two sets of answers or solutions. From the two the group decides on a compromise. The whole class reports out on their decisions. http://www.wcer.wisc.edu/archive/cl1/CL/doingcl/thinksq.htm

⁴ This strategy requires all students to participate in the discussion.

⁵ This reading has a lexile measure of 990, appropriate for the Common Core State Standards 4-5 grade cluster.
After a few minutes, have each student tell what the other just said. “The paraphrase might start, ‘I heard you say...’”

Ask students to share with the whole class what their partners said. Reverse the process.

**Strategy 3: Application**

**Trap Pond Case Study**

Have students read the informational text and complete the graphic organizer at the end of the [Humans Impact Ecosystems at Trap Pond State Park Case Study](#). Have students create a cause and effect timeline as follows that explains how humans impacted ecosystems over time at Trap Pond State Park.

What happened?

What happened?

What happened?

What happened?

What happened?

Why?

Why?

Why?

Why?

Why?

Complete the timeline, making sure to provide evidence supporting the explanation of why the event occurred.

**Check for Understanding**

- How have people adapted to or altered ecosystems? Explain your answer with an example.

**Rubric**

2 – This response gives a valid explanation with an accurate and relevant example.

1 – This response gives a valid explanation with an inaccurate, irrelevant, or no example.

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6 This reading has a lexile measure of 970, appropriate for the Common Core State Standards 4-5 grade cluster.