### World Language-STEM MODULE COVERSHEET

**切萨皮克湾：一个大家庭的故事**

<table>
<thead>
<tr>
<th>Target Language:</th>
<th>Chinese 中文</th>
<th>Grade Level: 4 and 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proficiency Level:</td>
<td>Junior Novice Low – Junior Novice Mid</td>
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</tbody>
</table>

**Enduring Understanding:**
The Chesapeake Bay is an ecosystem affected by many factors, including human activity.

**Essential Questions:**
What actions harm the Chesapeake Bay watershed?
What can we do to help the Chesapeake Bay watershed?

**Module Duration and Lessons:**
This module is designed for three to five 30-minute class periods per week over three to five weeks. Instructional time will depend on students’ previous knowledge of content and vocabulary, as well as their language proficiency. Other factors include program type and whether the module is used as the main core of instruction or as a supplementary resource.

- 第一课: 散步在海湾
- 第二课: 海湾的生态
- 第三课: 海湾的死区
- 第四课: 用行动来保护海湾
- 第五课: 評估

**Suggestions to teachers:**
You may want to consider using this module after using the *Water, Water Everywhere* and/or *From Seeds to Table* modules. The content from these two modules may serve as prior knowledge for this module on ecology.

In Lesson 4, students learn about chicken farms in the Chesapeake Bay watershed. If possible, arrange for a field trip to a local chicken farm or invite a farmer to visit your classroom. If these options are not possible, obtain an online video.

This module includes a story about Danny visiting his grandpa, Jim, who grew up on the Chesapeake Bay. The story is called “Chesapeake Bay: A Home for Many.” The text of the story is included in the accompanying PowerPoint so that students can narrate the story as you progress through the module.

**Context and Storyline:**
Jim lives along the Chesapeake Bay and his grandson, Danny, has come for a visit. As they walk together along the shore, Jim tells Danny about the Chesapeake Bay watershed and how it has changed over time. Danny learns about the animals of the Bay watershed, factors that have affected the health of the watershed and steps that can be taken to improve it.

**Standards Targeted**

<table>
<thead>
<tr>
<th>Standards Targeted</th>
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</thead>
<tbody>
<tr>
<td>5C’s – World-Readiness Standards for Learning Languages</td>
</tr>
</tbody>
</table>

1
**Communication:** Communicate effectively in more than one language in order to function in a variety of situations and for multiple purposes

- **Interpersonal Communication:** Learners interact and negotiate meaning in spoken, signed, or written conversations to share information, reactions, feelings, and opinions.
- **Interpretive Communication:** Learners understand, interpret, and analyze what is heard, read, or viewed on a variety of topics.
- **Presentational Communication:** Learners present information, concepts, and ideas to inform, explain, persuade, and narrate on a variety of topics using appropriate media and adapting to various audiences of listeners, readers, or viewers.

**Cultures:** Interact with cultural competence and understanding

- **Relating Cultural Practices to Perspectives:** Learners use the language to investigate, explain, and reflect on the relationship between the practices and perspectives of the cultures studied.
- **Relating Cultural Products to Perspectives:** Learners use the language to investigate, explain, and reflect on the relationship between the products and perspectives of the cultures studied.

**Connections:** Connect with other disciplines and acquire information and diverse perspectives in order to use the language to function in academic and career-related situations.

- **Making Connections:** Learners build, reinforce, and expand their knowledge of other disciplines while using the language to develop critical thinking and to solve problems creatively.
- **Acquiring Information and Diverse Perspectives:**

**SS: NGSS 3-LS4-3**
Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

**STEM:**

- Learn and apply rigorous science, technology, engineering, and mathematics content
- Interpret and communicate information from science, technology, engineering, and mathematics
- Engage in inquiry
- Engage in logical reasoning
- Apply technology strategically
Learners access and evaluate information and diverse perspectives that are available through the language and its cultures.

**Comparisons:** Develop insight into the nature of language and culture in order to interact with cultural competence
- **Language Comparisons:**
  Learners use the language to investigate, explain, and reflect on the nature of language through comparisons of the language studied and their own.
- **Cultural Comparisons:**
  Learners use the language to investigate, explain, and reflect on the concept of culture through comparisons of the cultures studied and their own.

**Communities:** Communicate and interact with cultural competence in order to participate in multilingual communities at home and around the world
- **School and Global Communities:**
  Learners use the language both within and beyond the classroom to interact and collaborate in their community and the globalized world.
- **Lifelong Learning:**
  Learners set goals and reflect on their progress in using languages for enjoyment, enrichment, and advancement.

### Knowledge: Students will know...

<table>
<thead>
<tr>
<th>Content-obligatory language:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 爷爷</td>
</tr>
<tr>
<td>• 切萨皮克湾区</td>
</tr>
<tr>
<td>• 鸟</td>
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<tr>
<td>• 鸭</td>
</tr>
<tr>
<td>• 鱼</td>
</tr>
<tr>
<td>• 捕食者</td>
</tr>
<tr>
<td>• 猎物</td>
</tr>
<tr>
<td>• 白头鹰</td>
</tr>
<tr>
<td>• 鱼鹰</td>
</tr>
<tr>
<td>• 鬼</td>
</tr>
</tbody>
</table>

### Skills: Students can...

<p>| |</p>
<table>
<thead>
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<tbody>
<tr>
<td>• Identify Chesapeake Bay organisms</td>
</tr>
<tr>
<td>• Show how organisms within an ecosystem depend on one another within food chains and food webs.</td>
</tr>
<tr>
<td>• Predict an ecosystem’s stability when one factor (abiotic or biotic) is changed.</td>
</tr>
<tr>
<td>• Identify pollutants that affect water quality in the Chesapeake Bay.</td>
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<tr>
<td>• Explain the relationship between healthy food chains and healthy ecosystems.</td>
</tr>
<tr>
<td>• Propose solutions, which could improve the water quality in the Chesapeake Bay.</td>
</tr>
</tbody>
</table>
切萨皮克湾：一个大家庭的故事

- 加拿大鹅
- 牛鲨
- 牛鼻鳐
- 鲈鱼
- 鳗鱼
- 牡蛎蟾鱼
- 红狐
- 软壳蛤
- 东方牡蛎
- 草虾
- 海马
- 蓝蟹
- 浮游植物
- 浮游动物
- 苦草
- 野鸭草
- 生态系统
- 分水岭
- 食物链
- 食物网
- 平衡
- 健康
- 人类/人
- 农业
- 农业废弃物
- 化肥
- 化学物
- 雨水径流
- 氮
- 污染
- 养分
- 氧
- 藻类
- 红木潮
- 死区
- 农场/农民
- 鸡
- 空气
- 工厂
- 房屋
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- 城市

Content-compatible language:
- 生活
- 土地
- 水
- 条纹
- 斑点
- 浮动
- 透明
- 东岸/西岸
- 吃/由被吃掉
- 依赖
- 使
- 删除
- 互动
- 河
- 绿泥
- 百分比
- 死
- 汽车
- 自行车
- 纸
- 减量化，再利用，再循环。
- 花园
- 树
- 植物
- 露营
- 垃圾

Expressions and patterns:
- 你喜欢___？
- 我喜欢___。我不喜欢___。
- 这是___。
- 它吃___。___吃它。
- 我最喜欢的动物是___。
- 它是大还是小？
- 它生活在陆地上还是在水中？
- 它游泳/飞/走/跑？
- 当___会发生什么？
- 为什么？
### Integrated Performance Assessments

#### Interpretive and Presentational Task

In Lesson 1, students identify and describe one of the animals of the Chesapeake Bay.

In Lesson 5, for the final performance assessment of this module, students record a podcast for an Earth Day contest in their school. In addition to a description of a Chesapeake Bay animal, the podcast will also include the animal’s habitat, the problems it faces, and how people can help. Students then listen to several of their classmates’ podcasts and identify the animals described.

#### Presentational Task

In Lesson 2, students design a postcard in which they summarize their learning about the Chesapeake Bay watershed and the animals that live there.

In Lesson 4, using a presentation format of their choice, teams of students research and present one problem facing the health of the Bay.

In Lesson 5, students assemble 我的海湾之旅 with the activities that were completed in this module. They share their book with a partner.

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#### Interpersonal Task

In Lesson 1, pairs of students discuss characteristics of Bay animals.

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### Materials/Resources:

- PowerPoint presentation: *A Home for Many*
- tape or glue sticks
- scissors
- Internet access for stations activities and videos
- online videos: a bald eagle or an osprey catching a fish, a blue crab or seahorse
- index cards
- markers or colored pencils
- a ball of yarn or string
- one large roasting pan (one per group) (such as a disposable aluminum pan, 16” x 12” x 3”)
- one sheet of thin plastic that is larger than the pan – one for each group of 4 students
- sheets of newspaper
- plastic wrap
- aluminum foil
- spray bottle (one for each group)
- large book (one for each group)
- green and orange gelatin mix
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- hot cocoa mix
- blue food coloring
- audio recording device
- optional: video camera
- STEM Background Resource 1: Animal Life of the Chesapeake Bay Watershed
- STEM Background Resource 2: Plant Life of the Chesapeake Bay Watershed
- Resource 1a: Images for small group activity
- Resource 1b: Flashcards for partner activity
- Worksheet 1a: 我的海湾之旅 (封面)
- Worksheet 1b: 切萨皮克湾 (one per student and one enlarged copy for class display)
- Worksheet 1c: Visuals to accompany Worksheet 1b (one set per student and one enlarged set for class display)
- Resource 2a: Visuals for food web activity (one set per student)
- Resource 2b: Arrows for food web activity (one page per group)
- Worksheet 2a: 我的食物链
- Worksheet 2b: 切萨皮克湾
- Worksheet 2c: 给朋友的一张明信片 (one per student duplicated on cardstock, if possible)
- Resource 3a: 流域的实验
- Worksheet 3a: 分水岭测试结果
- Worksheet 3b: 死区
- Worksheet 3c: 氮气污染了切萨皮克湾
- Resource 4a: List of Resources for Stations Activity
- Resource 4b: Rubric for Team Presentational Task
- Worksheet 4a: 探索问题
- Worksheet 5a: Final Performance Assessment

STEM Background for Teachers:
Biodiversity: The connection of living things to each other. Plants and animals depend on each other to survive.
Ecosystem: “Ecosystem” is short for “ecological system” and includes all the living organisms existing together in a particular area. These plants and animals within an area interact with each other and with the non-living elements of the area such as climate, water, soil, etc. An ecosystem can be very small such as a puddle or an area under a large rock, or it can be vast like Chesapeake Bay or the Atlantic Ocean. The balance of an ecosystem is delicate, and a disruption such as the introduction of a new element can damage it. Scientists group ecosystems that are similar into biomes. When we talk about the entire ecosystem of the whole planet, we call it the biosphere. (Sydenham, S. & Thomas, R. What is an ecosystem? [Online] www.kidcyber.com.au [2009]).

Each spring and summer in the Chesapeake Bay region, low-oxygen “dead zones” and harmful algae blooms appear in various parts of the Bay and its creeks and rivers. The size and severity of algae blooms and dead zones in the Bay depend on the amount of water that flows into the Bay. That water brings excess nutrients and sediment from the land. Combined with high temperatures, the excess pollutants can fuel the growth of algae blooms and cause the water to become clouded and discolored. The water condition is called a mahogany tide, which can cause the water to appear reddish brown. Mahogany tides may also deplete the water of oxygen, which may be why Jim and Danny saw dead fish. Algae blooms make conditions difficult for much of the aquatic life in the Chesapeake Bay. Algae blooms can be very detrimental to the health of the Bay. Some are considered harmful algae.
blooms (HABs) and can be toxic to aquatic life such as fish, oysters and crabs. They can also cause skin irritation or other sickness to people who come into contact with them. Even if algae blooms aren’t toxic, they can still be harmful to the Bay. When algae blooms get dense enough, they block sunlight from reaching Bay grasses growing at the bottom of the Bay. Of course, Bay grasses are vital to the Bay's health, so when fewer Bay grasses grow, the cycle of poor Bay health continues. When algae blooms die they create more problems, as the decomposition process sucks up most of the oxygen that fish, oysters and crabs needs to survive.

Since algae blooms are fueled by excess nutrients, you can do your part to help prevent algae blooms in your local waterway by taking small steps to decrease polluted runoff. Small steps such as not fertilizing your lawn, picking up your pet’s waste and planting more trees in your yard can make a difference. (Source: Chesapeake Bay News).

Additional resources included in this module:

- **STEM Background Resource 1:** Animal Life of the Chesapeake Bay Watershed
- **STEM Background Resource 2:** Plant Life of the Chesapeake Bay Watershed
- **Resource 4a:** List of Resources for Stations Activity
### Animal Life of the Chesapeake Bay Watershed

<table>
<thead>
<tr>
<th>Animal</th>
<th>Photo</th>
<th>Size</th>
<th>Color</th>
<th>Eating habits</th>
<th>Predators</th>
<th>Other Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>白头鹰（秃鹰）</td>
<td><img src="image1" alt="Eagle Photo" /></td>
<td>• 30-37”&lt;br&gt;• female larger than male&lt;br&gt;• wingspan of 72-90”</td>
<td>• black/brown&lt;br&gt;• white head&lt;br&gt;• yellow feet and beak</td>
<td>• fish&lt;br&gt;• ducks&lt;br&gt;• birds&lt;br&gt;• small animals (up to 4 lbs.)</td>
<td>humans</td>
<td>• national symbol of the USA&lt;br&gt;• powerful beak and claws&lt;br&gt;• can travel 30 mph</td>
</tr>
<tr>
<td>鱼鹰</td>
<td><img src="image2" alt="Fish Eagle Photo" /></td>
<td>2’</td>
<td>brown and white</td>
<td>fish</td>
<td></td>
<td>• hawk-like raptor&lt;br&gt;• wingspan of 6’&lt;br&gt;• migrates south August-March</td>
</tr>
<tr>
<td>加拿大鹅</td>
<td><img src="image3" alt="Canada Goose Photo" /></td>
<td>30-43”</td>
<td>brown, gray, white and black</td>
<td>plants</td>
<td>humans</td>
<td>• average wingspan of 5’&lt;br&gt;• can travel 2,400 miles per day</td>
</tr>
<tr>
<td>鸟</td>
<td><img src="image4" alt="Duck Photo" /></td>
<td>18-28”</td>
<td>red, brown, and white with green head</td>
<td>plants</td>
<td>humans</td>
<td>winters in Chesapeake Bay region, then migrates north</td>
</tr>
<tr>
<td>红狐</td>
<td><img src="image5" alt="Red Fox Photo" /></td>
<td>25”&lt;br&gt;6-15 lbs.</td>
<td>• reddish body&lt;br&gt;• black legs&lt;br&gt;• white belly</td>
<td>• fruits, seeds&lt;br&gt;• worms, insects&lt;br&gt;• small mammal&lt;br&gt;• small birds and their eggs</td>
<td>eagles&lt;br&gt;coyotes&lt;br&gt;other animals&lt;br&gt;humans</td>
<td>• usually only lives 3 years in the wild&lt;br&gt;• lives in swamps, forests, farms throughout the Chesapeake Bay watershed</td>
</tr>
<tr>
<td>鲈鱼(石斑鱼)</td>
<td><img src="image6" alt="Striped Bass Photo" /></td>
<td>20”</td>
<td>• light or olive green to blue, brown, black&lt;br&gt;• metallic sides are striped with 7-8 dark lines</td>
<td>• small fish&lt;br&gt;• invertebrates (worms, squid, menhaden, anchovies, and crustaceans)</td>
<td>sharks&lt;br&gt;larger fish&lt;br&gt;ospreys</td>
<td>• state fish of MD&lt;br&gt;• elongated body</td>
</tr>
<tr>
<td>Animal</td>
<td>Photo</td>
<td>Size</td>
<td>Color</td>
<td>Eating habits</td>
<td>Predators</td>
<td>Other Notes</td>
</tr>
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<td>--------------------------------</td>
<td>---------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>鲱鱼</td>
<td>![Fish]</td>
<td>max to 15”</td>
<td></td>
<td>• phytoplankton • zooplankton</td>
<td>• bluefish • weakfish • striped bass • predatory birds(osprey, eagles)</td>
<td>• forms a critical link between the upper and lower levels of the Bay food web • limited harvest</td>
</tr>
<tr>
<td>牛鼻鳐</td>
<td>![Ray]</td>
<td>• pups 11-18” • wingspan of up 3’ • 50 lbs.</td>
<td>brown</td>
<td>• oysters • clams</td>
<td>• cobia • bull sharks • sandbar sharks</td>
<td>• called a &quot;doublehead&quot; because of the indentation around its snout • swims by flapping its fins like bird</td>
</tr>
<tr>
<td>牛鲨</td>
<td>![Shark]</td>
<td>• max. 11’ • 690 lbs. • female larger than the male</td>
<td>grey on top and white belly</td>
<td>• bony fishes • rays • other sharks • crustaceans • turtles • mammals</td>
<td>humans</td>
<td>• one of three most aggressive, dangerous sharks • occasional summer visitor to the Chesapeake Bay • thrives in both saltwater and freshwater and can travel far up-river</td>
</tr>
<tr>
<td>牡蛎蟾鱼</td>
<td>![Toadfish]</td>
<td>12”</td>
<td>• olive-brown back with dark blotches/lines • pale belly</td>
<td>• small crabs • small fish • crustaceans</td>
<td>sharks</td>
<td>• Male makes a nest in a dark • Female lays sticky eggs on the top of the nest • Male protects the eggs and keep nest clean and guards the young toadlets for a few more weeks after eggs are hatched.</td>
</tr>
<tr>
<td>蓝蟹</td>
<td>![Crab]</td>
<td>4-9”</td>
<td>brown with blue claws</td>
<td>• omnivore • bottom-feeders</td>
<td>• fish • birds</td>
<td>10 legs</td>
</tr>
<tr>
<td>Animal</td>
<td>Photo</td>
<td>Size</td>
<td>Color</td>
<td>Eating habits</td>
<td>Predators</td>
<td>Other Notes</td>
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<td>--------------------------------------------</td>
</tr>
<tr>
<td>牡蛎</td>
<td></td>
<td>3-5”</td>
<td>white, gray and/or tan</td>
<td>filter feeder of plankton</td>
<td>humans</td>
<td>can produce 11 million eggs yearly</td>
</tr>
<tr>
<td>软壳蛤</td>
<td></td>
<td>3-4”</td>
<td>brown and white</td>
<td>filter feeder of plankton</td>
<td>• crabs</td>
<td>burrows up to 20’ deep</td>
</tr>
<tr>
<td>海马</td>
<td></td>
<td>5-6”</td>
<td>yellow, brown, or black</td>
<td>crustaceans</td>
<td>• crabs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• ducks</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• rays</td>
<td></td>
</tr>
<tr>
<td>草虾</td>
<td></td>
<td>1.5”</td>
<td>nearly transparent body</td>
<td>• worms</td>
<td>small fish</td>
<td>claws on the first two pairs of walking legs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• algae</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• tiny crustaceans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>浮游动物</td>
<td></td>
<td>microscopic range in size from single-celled protozoa to large jellyfish</td>
<td>• transparent • colors vary</td>
<td>phytoplankton</td>
<td>form a link between the phytoplankton community and larger species at higher levels in the food web</td>
<td>• free-floating animals • the most plentiful animals in the Bay and its rivers</td>
</tr>
</tbody>
</table>
# Plant Life of the Chesapeake Bay Watershed

<table>
<thead>
<tr>
<th>Plant</th>
<th>Photo</th>
<th>Size</th>
<th>Color</th>
<th>Predators</th>
<th>Other Notes</th>
</tr>
</thead>
</table>
| phytoplankton (algae)浮游植物（海藻） |       | microscopic | • red  
• brown  
• green | • fish  
• shellfish | • primary producers of oxygen and food for the bay  
• free-floating |
| 苦草                 |       | up to 4’ | green     | • birds  
• turtles | found in shallow, salty areas |
| 野鸭草               |       | up to 4” | green     | • migratory waterfowl | • Pollen floating on the water’s surface fertilizes the flowers, which then produce seeds.  
• common in shallow areas |
<table>
<thead>
<tr>
<th>Lesson 1 of 5</th>
<th>散步在海湾</th>
</tr>
</thead>
</table>
| **Objectives** | I Can: **Oral language:**  
| | • Identify animals that live on the Chesapeake Bay.  
| | • Tell if an animal lives on land, water, or both.  
| | • Say if I like certain animals.  
| | • Use pictures, a map and simple words to explain a watershed.  
| | **Literacy:**  
| | • Recognize and label some of the names of animals found in the Chesapeake Bay watershed.  
| | **STEM and Other Subject Areas:**  
| | • Express a basic understanding of predators and prey.  
| **Vocabulary and Expressions** | **Prior Knowledge:**  
| | • 颜色  
| | • 数目  
| | • 长/短，大/小，美丽/难看  
| | **Content obligatory language:**  
| | • 爷爷  
| | • 切萨皮克湾区  
| | • 鸟  
| | • 鸭  
| | • 鱼  
| | • 捕食者  
| | • 猎物  
| | • 禾无(白头鹰)  
| | • 鱼鹰  
| | • 鬼  
| | • 加拿大鹅  
| | • 牛鲨  
| | • 牛鼻鳐  
| | • 鲈鱼  
| | • 鲱鱼  
| | • 牡蛎塘鱼  
| | • 赤狐/红狐/火狐  
| | • 软壳蛤  
| | • 东方牡蛎 |
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- 草虾
- 海马
- 蓝蟹
- 浮游植物
- 浮游动物
- 苦草
- 野鸭草

Content compatible language:
- 生活
- 土地
- 水
- 条纹
- 斑点
- 浮动
- 透明
- 东岸/西岸

Expressions and patterns:
- 你喜欢__?
- 我喜欢__。我不喜欢__。
- 这是__。
- 它吃__。__吃它。
- 我最喜欢的动物是__。
- 它是大还是小？
- 它生活在陆地上还是在水中？
- 它会游泳/飞/走/跑？
- 当__会发生什么？
- 为什么？

Materials/Resources
- PowerPoint slides 1-13
- tape or glue sticks
- scissors
- Internet access
- online videos: a bald eagle or an osprey catching a fish, a blue crab or seahorse
- STEM Background Resource 1: Animal Life of the Chesapeake Bay Watershed
- STEM Background Resource 2: Plant Life of the Chesapeake Bay Watershed
- Resource 1a: Images for small group activity
- Resource 1b: Flashcards for partner activity
- Worksheet 1a: 我的海湾之旅(封面)
- Worksheet 1b: 切萨皮克湾(one per student and one enlarged copy for class display)
Lesson Storyline

Jim lives along the Chesapeake Bay. Danny, his grandson, is visiting Jim this summer. As they walk together along the Bay, Jim tells Danny about the Chesapeake Bay and the animals that live there.

Key Elements

Lesson 1: 散步在海湾

Engagement

● Object, event or question used to engage students.

● Connections facilitated between what students know and can do

NOTE: For this module, students will create a 我的海湾之旅, (Worksheet 1a) in which they will assemble the worksheets that they complete in these lessons.

T: 同学们，早上好！今天我要介绍马里兰有名的海湾-切萨皮克湾。

PPT 1-2
T: 首先我们先看看住在哪里？(Point out Baltimore on the map. Talk about the western vs. the eastern shore of Maryland.)
T: 我们住在切萨皮克湾的西岸。丹尼的祖父住在切萨皮克湾的东岸。
T: 我们怎样从这儿到海岸的那儿呢？
T: 你曾经横跨海湾大桥吗？
Students respond.
Engage students in a conversation about their experiences on the Eastern Shore.

PPT 3
T: 你去哪些地方？你去看谁？你做了什么？又看到了什么？
Students respond.

PPT 4
T: 丹尼过海湾大桥去看他的爷爷。他爷爷住在切萨皮克湾, 我们来听听丹尼的爷爷告诉我们海湾的生活。

PPT 5
T: 我们来看看一些生活在切萨皮克湾动物，你喜欢动物吗？

- Engage students in conversation using the following questions.
- Encourage students to use multiple animals in their sentences and also learn to use the negative response, such as “I do not like ducks.”
  （指导学生以大拇指向上/向下打信号）。
  ○ 你喜欢动物吗？
  ○ 你喜欢______？
  ○ ______是生活在陆地上还是在水中？
  ○ ______是飞行或是游泳？
  ○ 哪个是你的比较喜欢 - 鸭子还是鸟？
Continue until all four animals have been chorally repeated.

介绍秃鹰
T: 秃鹰它代表美国，是一只特别的鸟。
Engage students in a discussion and choral repetition about the bald eagle using familiar vocabulary and expressions, such as size, color, and other
physical descriptions.
- This is an eagle.
- What color is an eagle?
- Is an eagle big or small?
- Can an eagle fly or swim?
- What does an eagle eat?
- It eats fish and small animals, such as ducks.
- Fish are eaten by an eagle.

T: This is an eagle, and it lives in the Chesaapeake Bay region year-round. An eagle is from August to March. The osprey is a bird that is important in the Chesaapeake Bay area.
- This is an osprey.
- What color is an osprey?
- Is an osprey big or small?
- Can an osprey fly or swim?
- What does an osprey eat?
- It eats fish and small animals, such as ducks.

Engage students in a discussion and choral repetition about the osprey using familiar vocabulary and expressions, such as size, color, and other physical descriptions.
- This is an osprey.
- What color is an osprey?
- Is an osprey big or small?
- Can an osprey fly or swim?
- What does an osprey eat?
- It eats fish and small animals, such as ducks.
- Fish are eaten by an osprey.

T: This is a Canada goose, and it moves from September to March to the Bay.
- Canada geese move from September to March to the Bay.
- Ducks also move from September to March to the Bay.

Engage students in questions about the Canada goose and ducks such as the color, the size, and other physical descriptions.
- What color is a Canada goose?
- Is a Canada goose big or small?
- Can a Canada goose fly or swim?
- What does a Canada goose eat?
- It only eats plants. It doesn’t eat animals, such as eagles and ospreys.
- Who eats it?
- You think it is eaten by other animals?

T: Yes! It is eaten by other animals.
T: All these birds live in the Chesaapeake Bay region.
T: We learn all about the Chesaapeake Bay and make a diary. This is your diary. We call it "My Chesaapeake Bay Adventure."

Distribute Worksheet 1a and instruct students to write their name in the space provided.
(This will become the cover for their journal. All worksheets in this module will be collected for inclusion in My Chesaapeake Bay Adventure.)
<table>
<thead>
<tr>
<th>World Language-STEM MODULE COVERSHEET</th>
<th>切萨皮克湾：一个大家庭的故事</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Objects and phenomena are explored.</td>
<td></td>
</tr>
<tr>
<td>● Hands-on activities, with guidance.</td>
<td></td>
</tr>
<tr>
<td><strong>NOTE:</strong> Prepare one set per student of the visuals from Part 1 only of Resource 1c.</td>
<td></td>
</tr>
<tr>
<td><strong>PPT 5</strong></td>
<td></td>
</tr>
<tr>
<td>复习鸟，鸭，秃鹰，鱼鹰，加拿大鹅，和野鸭。</td>
<td></td>
</tr>
<tr>
<td>Discuss what they eat.</td>
<td></td>
</tr>
<tr>
<td>T: 鹰是鱼的捕食者。</td>
<td></td>
</tr>
<tr>
<td>T: 鱼是鹰的猎物。</td>
<td></td>
</tr>
<tr>
<td>Continue to practice 捕食者 and 猎物 with the 鱼鹰，加拿大鹅，和野鸭。</td>
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</tr>
<tr>
<td><strong>PPT 6</strong></td>
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<tr>
<td>T: 这些动物也有捕食者。加拿大鹅和野鸭的捕食者是赤狐。</td>
<td></td>
</tr>
<tr>
<td>Engage in conversation use choral repetition and questions such as:</td>
<td></td>
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<tr>
<td>• 赤狐是什么颜色？</td>
<td></td>
</tr>
<tr>
<td>• 赤狐是大还是小？</td>
<td></td>
</tr>
<tr>
<td>• 赤狐生活在陆地上还是在水中？</td>
<td></td>
</tr>
<tr>
<td>• 赤狐吃什么？</td>
<td></td>
</tr>
<tr>
<td>• 赤狐能飞/游泳/走路/跑吗？</td>
<td></td>
</tr>
<tr>
<td>Divide students into two equal groups for an Inside/Outside Circle communicative activity. Each student will ask a variety of questions to their face partner about the animals that they have learned.</td>
<td></td>
</tr>
<tr>
<td>• Display the questions for reference during the activity.</td>
<td></td>
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<tr>
<td>○ 你喜欢_____？</td>
<td></td>
</tr>
<tr>
<td>○ 它是什么颜色？</td>
<td></td>
</tr>
<tr>
<td>○ 它在哪里？（在陆地/水中）</td>
<td></td>
</tr>
<tr>
<td>○ 它会不会飞/游泳/走路？</td>
<td></td>
</tr>
<tr>
<td>○ 它是大还是小？</td>
<td></td>
</tr>
<tr>
<td>○ 它吃什么？</td>
<td></td>
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<tr>
<td>○ 什么吃它呢？</td>
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<tr>
<td>Distribute one flashcard from Resource 1a to each student.</td>
<td></td>
</tr>
<tr>
<td>• Direct students to form two circles facing each other.</td>
<td></td>
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<tr>
<td>• Model one set of questions/answers with a student. Exchange cards with the student.</td>
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<tr>
<td>• Encourage students to use different questions for each turn.</td>
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<tr>
<td>• After each pair has asked and answered their questions, use an audible or hand signal to direct students to exchange cards.</td>
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<tr>
<td>• Then direct the outside circle to move one student to the right. (The inside circle will not move.)</td>
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<tr>
<td>• Continue in this manner until students meet their original partner.</td>
<td></td>
</tr>
<tr>
<td>• Remind students to exchange cards before moving to the next partner.</td>
<td></td>
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<tr>
<td><strong>PPT 7</strong></td>
<td></td>
</tr>
<tr>
<td>T: 这是切萨皮克湾。什么动物住在这儿？</td>
<td></td>
</tr>
<tr>
<td>（复习 秃鹰，鱼鹰，加拿大鹅，野鸭，红狐狸）</td>
<td></td>
</tr>
</tbody>
</table>
Distribute **Worksheet 1b**, one set of visuals from **Worksheet 1c**, (Part 1 ONLY) and glue sticks to each student.

**T:** 我们每个人都要做一个海报来介绍海湾。老师做一个示范。
- 选一个动物图形，把动物的名字写在图形的反面。
- 请一个学生把这动物图形放在适当的海报位置，地上或水里。
- 用胶带或胶水将动物图形贴在海报上，只贴上面部分。
- 给每个学生一份动物图形。
- 在每个动物图形后面，指导学生写动物的名称。
- 把动物图形放在适当的海报位置。
- 指导学生用胶水沿动物图形的顶边贴好，翻转时露出反面动物的名字。
- 协助需要帮忙的学生。

**Collect Worksheet 1b** for inclusion in the **我的海湾之旅**. It will be re-distributed and completed in future segments.

**Explanation**
- **Students explain their understanding of concepts and processes.**
- **New concepts and skills are introduced as conceptual clarity and cohesion are sought.**

**Danji学习有关食物链**

**NOTE:** Prepare one set per student of the visuals from Part 2 only of **Worksheet 1c**.

**PPT 8**

**T:** 我们现在要和丹尼一起到海湾去散步。

Invite a student to read the text on the slide.

**T:** 发生了什么事？

**T:** 他问爷爷什么？
- 谁吃鱼？
- 哪个是掠食者？
- 哪个是猎物？

Show a video of either a bald eagle or an osprey catching a fish.

**PPT 9**

**T:** 这儿是一些重要的鱼类和鸟类。

介绍鲈鱼，鲱鱼，牛鼻鳐，牡蛎蟾鱼，和公牛鲨。
- 鲈鱼大且灰色。
- 鲱鱼有灰色的斑点。
- 牛鼻鳐是棕色的。
- 鲈鱼和鲱鱼是秃鹰的猎物。
- 公牛鲨鱼吃小鱼。
- 牡蛎蟾鱼是黄色和棕色。

**T:** 我们去海湾钓鱼吧。

- Distribute either a picture or a word card to each student from **Resource 1b**.
- Instruct students to circulate around the room in order to locate their matching card and practice one sentence about their picture to share with the class.
- Students repeat their sentence(s) to the class.

Other options for communicative activities:
Create a matching game using the Smart Board. Invite students to take turns matching the word to the visual as they use it in a sentence.

- Use one set of cards for a game of Memory.
  - Number the backs of the cards.
  - Place the cards face down between two or more students.
  - Instruct students to take turns selecting two numbers and turning over the cards.
  - If the cards match (visual and correct word), the student uses the word in a sentence and keeps the cards.
  - If the cards do not match, they are placed faced down and the next student takes a turn.
  - Continue in this manner until all cards have been matched.

Re-distribute Worksheet 1b.

T: 让我们来在我们的海报加点动画物。

Instruct students to continue with Worksheet 1b and the flashcards from Part 2 of Worksheet 1c.

- On the reverse side of each visual, instruct students to flip the flashcard upside down and write the name of the animal.
- Instruct students decide where the animal should be placed on the poster. (land or water)
- Instruct students to glue or tape the visuals along the top edge only, so that the visual can be flipped up to reveal the name of the animal on the reverse side.
- Assist students as needed.
- Collect Worksheet 1b for inclusion in the my bay trip. It will be re-distributed and completed in future segments.

### Elaboration

- Activities allow students to apply concepts in contexts, and build on or extend understanding and skill.

T: 丹尼学会如何保持海湾的各种类型的植物和动物。

NOTE: Videos are readily available online for many of the animals in this segment. They will be very helpful to engage students and prompt conversation.

T: 我们和丹尼与爷爷一起在海湾散步，我们也可以看到其他动物如何在切萨皮克湾一起生活。

PPT 10
T: 丹尼看到什么？
Invite a student to read the text on the slide.
如果可能的话，从网上找 蓝蟹录像带给学生看。

PPT 11
T: 我们看爷爷怎么描述大叶藻和野鸭草。

- 大叶藻和野鸭草是绿色的。
- 它们生活在水中。
- 鱼吃野鸭草。(Substitute menhaden, striped bass, etc.)
PPT 12
T: 但也有些植物和动物，我们看不到。
- 浮游动物是生活水中非常小的动物。
- 它们有很多种不同的颜色。
- 它们是很多动物的重要食物。

PPT 13
Engage students in meaningful conversation. For example:
- 蓝蟹在马里兰非常重要的。
- 你喜欢吃螃蟹吗？
- 他们住在海湾的哪里？
- 你喜欢吃牡蛎吗？
- 东方牡蛎是灰色的。
- 东方牡蛎吃浮游动物和植物。
- 软壳蛤也住在海湾。
- 软壳蛤和牡蛎有助于保持水的清洁。
- 软壳蛤，牡蛎，蓝蟹是蟹，鸭，鱼的猎物。

Point to the seahorse and grass shrimp.
T: 这里有两种是住在海湾有趣动物，海马和草虾。
- 海马漂浮在草丛里。
- 草虾小而透明。
- 它飞/游泳/运行？
- 它是大还是小？

如果可能的话，从网上找海马和草虾的录像带给学生看。

T: 我们把我们学到的所有的动物和植物都放在我们的海报上。
- Distribute the remaining flashcards from Part 3 and 4 of Worksheet 1c.
- Instruct students to complete Worksheet 1b as completed previously.
- Collect Worksheet 1b for inclusion in 我的海湾之旅。

Option for more practice: Duplicate multiple copies of the flashcards for students to play Go Fish! Or Memory game.

Evaluation
● Students assess their knowledge, skills and abilities. Activities permit evaluation of student development and lesson effectiveness.

Students will identify and describe one animal of the Chesapeake Bay learned in this lesson.
Interpretative and Presentation Performance Assessment: 我是谁？
- 在索引卡上写上动物的名字，然后放在盒子里。
- 给每个学生五到十分钟和同学练习他们海报上的动物。
 Worksheet 1b
- 鼓励学生描述动物尽可能越详细越好。
- 收集 Worksheet 1b。
- 每个学生抽一张索引卡。
- 指导学生描述他们所抽到的动物，尽可能多用句子，包括大小，颜色，在那里生活，它吃什么，等等。
World Language-STEM MODULE COVERSHEET
切萨皮克湾：一个大家庭的故事

- 鼓励学生使用手势来传达意义。
- 钟给学生10-15分准备。
- 每个学生按时出席，并完成他们的介绍 - 我是谁？
- 学生将说明：您是第____！
- 如果需要的话以录像机录像。

NOTE: Depending on the ability levels of your students, provide prompts/sentence starters as needed.

<table>
<thead>
<tr>
<th>Teacher Reflection Lesson 1 - <em>Jim and Danny walk along Chesapeake Bay</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What worked well?</strong></td>
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<td></td>
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<tr>
<td><strong>What did not work well?</strong></td>
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<tr>
<td><strong>What would I do differently?</strong></td>
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<tr>
<td><strong>Other comments or notes</strong></td>
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<tr>
<td></td>
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</tbody>
</table>
Lesson 2 of 5

<table>
<thead>
<tr>
<th>Objectives</th>
<th>I Can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral language:</td>
<td>Name animals in a food chain</td>
</tr>
<tr>
<td></td>
<td>Use pictures and simple words to tell what an ecosystem is and give examples</td>
</tr>
<tr>
<td></td>
<td>Use pictures to describe how food chains form food webs</td>
</tr>
<tr>
<td>Literacy:</td>
<td>Recognize names of animals in a food web</td>
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<tr>
<td></td>
<td>Recognize the word <em>watershed</em> and label an example on a map</td>
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<tr>
<td></td>
<td>Use pictures, a map and simple words to explain a watershed</td>
</tr>
<tr>
<td>STEM and Other Subject Areas:</td>
<td>Explain how food chains and food webs are interrelated and how they support ecosystems</td>
</tr>
<tr>
<td></td>
<td>Express a basic understanding of a watershed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vocabulary and Expressions</th>
<th>Content obligatory language:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>生态系统</td>
</tr>
<tr>
<td></td>
<td>分水岭</td>
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<td></td>
<td>食物链</td>
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<td>食物网</td>
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<td></td>
<td>平衡</td>
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<td></td>
<td>健康</td>
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<tr>
<td></td>
<td>人类</td>
</tr>
<tr>
<td>Content compatible language:</td>
<td>吃/被吃掉</td>
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<td></td>
<td>打猎</td>
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<td></td>
<td>依赖</td>
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<td>使</td>
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<td></td>
<td>消失</td>
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<td></td>
<td>互动</td>
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<td></td>
<td>百分比</td>
</tr>
<tr>
<td>Expressions and patterns:</td>
<td>怎么了？</td>
</tr>
</tbody>
</table>
### World Language-STEM MODULE COVERSHEET

### 切萨皮克湾：一个大家庭的故事

<table>
<thead>
<tr>
<th>Materials/Resources</th>
<th>Lesson Storyline and Core Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>o PowerPoint slides 13 – 21&lt;br&gt;o ball of string&lt;br&gt;o index cards&lt;br&gt;o colored pencils&lt;br&gt;o <strong>Resource 2a</strong>: Visuals for food web activity (one set per student)&lt;br&gt;o <strong>Resource 2b</strong>: Arrows for food web activity (one page per group)&lt;br&gt;o <strong>Worksheet 2a</strong>: 我的食物网&lt;br&gt;o <strong>Worksheet 2b</strong>: 切萨皮克湾流域&lt;br&gt;o <strong>Worksheet 2c</strong>: 给朋友的一张明信片 (one per student duplicated on cardstock, if possible)</td>
<td>Jim explains how the plants and animals are part of an ecosystem and depend on each other. He explains the food web found in the Chesapeake Bay. The Chesapeake Bay is an ecosystem.&lt;br&gt;Our ecosystem includes the plants and animals that are found in the Chesapeake Bay area. These plants and animals depend on each other to survive. All the plants and animals in an ecosystem interact with each other. Some plants and animals are food for other plants and animals. They form a food chain. The animals that eat other animals and plants are predators. The plants and animals that others eat are prey. In one food chain example, blue crabs eat zooplankton. And you and I eat blue crabs! We are part of the ecosystem and food chain! In another food chain, clams eat zooplankton. Birds eat clams. A red fox eats birds. Many food chains together form a food web.&lt;br&gt;A healthy ecosystem is one with a balanced food web. There are not too many predators or prey. Look at the top of this food web, Danny. That’s you and me! When we catch fish for supper, we are part of the food web!</td>
</tr>
</tbody>
</table>

### Key Elements | Lesson 2 Procedures

**Engagement**

- **Object, event or question used to engage students.**
- **Connections facilitated between what students know and can do.**

**NOTE:** Prepare one set of visuals and one set of arrows for each pair of students.

**PPT 13**

T: 想一想住在住在切萨皮克湾的动物。谁可以说出哪些动物是生活在切萨皮克湾？

Students respond.

- Distribute one set of the visuals from **Resource 2a** to each pair of students. (The arrows will be distributed later in this lesson.)
- Call on students to name an animal.
- Point to the animal on **PPT 13** or on the poster.
- Then ask the students to hold up the flashcards of this animal.
- Ask: 它是捕食者还是猎物？
- Continue in this manner, asking students to hold up the appropriate flashcards as students answer and chorally repeat.
**World Language-STEM MODULE COVERSHEET**

切萨皮克湾：一个大家庭的故事

- Ask additional questions such as:
  - 你认为哪一个动物既是捕食者，哪个是猎物？
  - 哪些动物是食肉动物？
Instruct students to select two flashcards and ask a partner:
  - 你认为哪一个动物既是捕食者？
  - 你认为哪一个动物既是猎物？

**PPT 14**
Invite students to ask each other the questions on the slide. Encourage students to substitute other animals they have learned.

**PPT 15**
Introduce a food chain.
T: 当一个动物吃掉其他动物的时候，我们称为食物链。看这个食物链。
例如：人们吃______，然后______吃______。
Instruct each student to use this pattern to arrange four different flashcards into a food chain on their desks.
- Conduct a Gallery Walk in which students look at several other food chains and discuss using the pattern, ___ 吃___, ___ 吃___ 。。。
- Distribute Worksheet 2a and instruct students to draw a food chain with different animals and plants.
- Collect Worksheet 2a for inclusion in the 我的海湾之旅.
- Collect the flashcards to be used in the following segment.

**Exploration**
- Objects and phenomena are explored.
- Hands-on activities, with guidance.

什么是食物网？

Distribute the flashcards from Resource 2a.

**PPT 15**
T: 我们从食物链里可以看到植物和动物互相依赖。有时一个动物可以有一个以上的猎物？
T: 除了人类还有什么动物吃蓝蟹？

**PPT 16**
T: 对！就像这张图片，动物可能有一种以上的捕食者。
T: 当食物链链接在一起，相互影响，我们称之为食物网。

**PPT 17**
Discuss examples of predators and prey using the animals on the slide.
Making food webs.
- Divide students into groups of 3-5.
- Instruct each student to create his/her own food chain using four of the flashcards. The different food chains should be arranged side by side on their tables.
- Distribute one set of arrows from Resource 2b to each group.
- Then, instruct students to connect their own food chain to their partners’ food chains at their table using the arrows, and to explain
their webs. For example: 秃鹰吃蓝蟹, as the student points the arrow from the bald eagle to the menhaden in the adjoining food chain.

- Conduct a Gallery Walk so that each group can review and check for accuracy of the food webs of the other groups.
- Collect the flashcards.

T: 如果我们是食物链的动物。我们可以做我们自己的食物网吗？
Hold up the ball of string. Instruct students to form a circle.
- 现在每个人都是海湾的动物之一。
- 然后我把线球给你们中的一人，你再把线球给另一个人。
- 直到你们每个人都拿到了线球。
- 我们就像食物网一样，每个人都互相连接！

After all students are connected with the string:
T: 你看到了吗？我们每个人都相互连接，就像在食物网！

Students respond.
T: 如果现在有动物从食物网中消失，那么网会发生什么变化？
Instruct one student to drop his/her string, and to step back from the circle.
T: 我们还会有食物网吗？
Students respond.

Instruct two more students to drop the string and step back from the circle.
T: 如果又有两个动物从食物网中消失，网又会发生什么变化？
Students respond.
Instruct three people to drop the string and step back from the circle.
T: 如果又有三个动物从食物网中消失，这又会发生什么变化？
Students respond.
T: 没错！随着越来越多的动物从食物网消失食物网会越来越弱。动物无法生活，就成为所谓的死区。

**Explanation**

- Students explain their understanding of concepts and processes.
- New concepts and skills are introduced as conceptual clarity and cohesion are sought.

**生态系统**

PPT 18
T: 我们现在来听听丹尼的爷爷怎么解释在海湾食物网。
Invite students to read the text on the slide.
Engage students in a conversation using the images on the slides.
- 秃鹰的猎物是什么？
- 野鸭的猎物是什么？
- 动物的浮游动物和浮游植物的捕食者是什么？
- 这是个猎物还是掠食者？
- 为什么一个生态系统需要捕食者和猎物平衡？
- 为什么丹尼的爷爷说“人是食物网的一部分？”

Re-distribute Worksheet 1b.
- 教导学生从画的箭头，尽可能连接捕食者及它的猎物动物，越多
**World Language-STEM MODULE COVERSHEET**

**切萨皮克湾：一个大家庭的故事**

<table>
<thead>
<tr>
<th>越好。老师可以示范一个例子。</th>
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</thead>
<tbody>
<tr>
<td>• 引导学生如何些切萨皮克湾的生态系统。</td>
</tr>
<tr>
<td>• 指导学生与同组同学讨论他们的选择，每次使用不同的动物</td>
</tr>
<tr>
<td>○ 此________是____________的捕食者。</td>
</tr>
<tr>
<td>○ 此________是____________的猎物。</td>
</tr>
<tr>
<td>• 要求学生将学的生态系统做个总结。</td>
</tr>
<tr>
<td>• 切萨皮克湾的生态系统是一个更大的系统的一部分，我们称为一个分水岭。让我们来听听爷爷的解释。</td>
</tr>
</tbody>
</table>

Collect **Worksheet 2a** for inclusion in the **我的海湾之旅**.

**Elaboration**

**Activities allow students to apply concepts in contexts, and build on or extend understanding and skill.**

**The Chesapeake Bay Watershed PPT 19-22**

**T:** 让我们继续丹尼和爷爷切萨皮克湾的故事。

Invite students to read the text on the slides.

- Engage students in conversation about the states，马里兰州，西弗吉尼亚州，弗吉尼亚州，纽约州，特拉华州，宾夕法尼亚州和华
盛顿特区 and about how the rivers flow into the Bay, and the Bay into the Atlantic Ocean.
- Distribute **Worksheet 2b**.
- Assist students in labeling the watershed map.
- Collect **Worksheet 2b** for inclusion in the **我的海湾之旅**.

**Evaluation**

- **Students assess their knowledge, skills and abilities.**
- **Activities permit evaluation of student development and lesson effectiveness.**

**Interpretative, Interpersonal and Presentational Performance Assessment**

Students design a postcard to send to a friend.

- Cut out one postcard per student from **Worksheet 2c**. (If possible, use cardstock paper.)
- Display and read the instructions:
  
  今天我们每个人要寄一张明信片给我们的朋友告诉他们关于切萨皮克湾的动物和植物！画一幅画，总结你所学到的。

  明信片要包括： 海湾和你想告诉你的朋友关于海湾的消息。

  Options:
  
  ○ Depending on the ability levels of your students, you may choose to display the word bank included with **Worksheet 2c**. (Not all words will be used, depending on your students’ choices for some of the animals; and there may be more than one response for some sentences.)
  
  ○ Read the message to the students and have them write the missing words in the blanks.
- Distribute the postcards and colored pencils.
- 教学生如何用中文写信和明信片
- When students have completed their postcards, direct them to read their messages to one or more classmates.
- Display the postcards in the classroom, or collect for inclusion in **我的海湾之旅**.

<p>| 26 |</p>
<table>
<thead>
<tr>
<th>Teacher Reflections on Lesson 2 - <em>The Ecosystem of the Bay</em></th>
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<tbody>
<tr>
<td><strong>What worked well?</strong></td>
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<td><strong>What did not work well?</strong></td>
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<td><strong>What would I do differently?</strong></td>
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<td><strong>Other comments or notes</strong></td>
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<td><strong>Objectives</strong></td>
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**World Language-STEM MODULE COVERSHEET**

### 切萨皮克湾：一个大家庭的故事

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<table>
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<tr>
<td></td>
<td>什么错？</td>
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</table>

**Materials/Resources**

- PowerPoint 22 - 42
- Resource 3a: 流域实验
- Worksheet 3a: 分水岭测试结果
- Worksheet 3b: 死区
- Worksheet 3c: 氮污染在切萨皮克湾有照片
- one large roasting pan (one per group) (such as a disposable aluminum pan, 16” x 12” x 3”)
- sheets of newspaper
- plastic wrap
- aluminum foil
- spray bottle of water (one per group)
- large book (one per group)
- green and orange gelatin mix
- hot cocoa mix
- blue food coloring

**Lesson Storyline and Core Text**

Jim shows Danny dead zones in Chesapeake Bay.

Jim and Danny continue exploring the Chesapeake Bay. They stop and look at the water and notice a green slime on the surface. Jim explains how algae affect the food web of the Bay. They further investigate other pollution and dead zones. Later, Jim explains to Danny that the rivers from all of the states of the Chesapeake Bay Watershed bring pollution. Danny says, “Grandpa, what can we do to help the animals in the Bay?”

### Key Elements

#### Exploration

- Objects and phenomena are explored.
- Hands-on activities, with guidance.

**Creating a watershed and testing the effects of pollution**

Vocabulary introduced: *pollution, fertilizer, agriculture*

T: 我们今天要做一个分水岭的实验，从这实验中我们可以看到污染是怎么形成的。

PPT 24-25

Model the experiment.

- Review the directions as you model each step.

### Lesson 3 Procedures

**How pollution affects a watershed**

T: 切萨皮克湾流域流过哪些州？(Refer to PPT 21, if needed.)

Students respond.

T: 许多的动物依靠切萨皮克湾流域组成一个健康的生态系统。

PPT 22-23

Invite a student to read the text on the slides.

T: 爷爷告诉我们，越来越多的人和工厂搬到这里。这是好呢还是不好呢？（用简单的词汇，帮助学生试着用他们所学的表达他们的意思。）
<table>
<thead>
<tr>
<th>Explanation</th>
<th>Defining dead zones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students explain their understanding of concepts and processes.</td>
<td>Vocabulary introduced: algae, green slime, mahogany tide, nitrogen, oxygen, dead zone</td>
</tr>
<tr>
<td>2. New concepts and skills are introduced as conceptual clarity and cohesion are sought.</td>
<td>PPT 26-31</td>
</tr>
</tbody>
</table>

**T:** 什么造成切萨皮克湾的分水岭污染？
Students respond.
Collect Worksheet 3a for inclusion in the 我的海湾之旅.

**Elaboration**

Why the Chesapeake Bay is polluted
Vocabulary introduced: chicken farms, chemicals, storm water runoff, factories, houses, cities

**T:** 我们再来来看看爷爷是怎么解释死区。
Engage students in conversation using questions such as:
- 红木潮/藻类是什么颜色？
- 污染从哪里来？
- 鱼不能呼吸会怎么样？
- 我们怎么形容海湾的死区？

1. Distribute Worksheet 3b and colored pencils.
2. Instruct students to draw a dead zone and to write at least three sentences that describe their illustration.
3. Pair students and instruct them to share their drawing and sentences with their partners.
4. Collect Worksheet 3b for inclusion in the 我的海湾之旅.

**T:** 我们再来听听爷爷的解释。

**PPT 32-34**
Invite students to read the text on the slides.
Chorally repeat the vocabulary in context.

**PPT 35-42**
**T:** 让我们去四处看看！

- Invite students to read the text on the slide.
- Engage students in conversation and use choral repetition for each slide.
  - 养鸡场
  - 化学品和雨水径流
  - 工厂
  - 房子和城市

**PPT 43**
**T:** 下面是科学家已经发现了关于在海湾的氮污染。
### World Language-STEM MODULE COVERSHEET

切萨皮克湾：一个大家庭的故事

- Discuss the percentages of each type of pollution listed in the infographic.
- Instruct students to engage in conversation with partners as they observe the infographic.
- Model one or two examples.
  - 空气污染是由于__________________________.
  - 养鸡场造成_____________________________.
- In small groups, instruct students to share their sentences.

#### Evaluation

- Students assess their knowledge, skills and abilities.
- Activities permit evaluation of student development and lesson effectiveness.

#### Identifying Causes of Chesapeake Bay Pollution

PPT 43

T: 让我们来回顾一下我们了解的海湾氮污染。

- 讨论空气和水的污染
- T: 污染从哪里来？(Solicit several responses.)
- T: 你可以举出一些污染的例子吗？
  - Distribute Worksheet 3c, Model one or more examples. (Place the photograph next to its corresponding category and draw an arrow connecting it to that category on the pie chart.)
  - Instruct students to glue the photographs in the correct section
  - Assist as needed.
  - Collect Worksheet 3c for inclusion in the 我的海湾之旅.

Options for reviewing student responses:

- Make a larger version of the graph and photographs and invite students to label the graph.
- Use Smart Board software to create an interactive chart for students to move the photographs to their correct location on the pie chart.

### Teacher Reflection Lesson 3 - Dead Zones in the Bay

<table>
<thead>
<tr>
<th>What worked well?</th>
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<th>What did not work well?</th>
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<th>What would I do differently?</th>
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<th>Other comments or notes</th>
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<td>Lesson 4 of 5</td>
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<tr>
<td><strong>Objectives</strong></td>
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<tr>
<td><strong>Vocabulary and Expressions</strong></td>
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<tr>
<td><strong>Materials/Resources</strong></td>
</tr>
<tr>
<td><strong>Lesson Storyline and Core Text</strong></td>
</tr>
</tbody>
</table>
## Key Elements

### Engagement
- **Object, event or question used to engage students.**
  - Connections facilitated between what students know and can do

### Lesson 4 Procedures

#### Identifying the problems

**Before viewing:**
- Brainstorm a list of reasons that the Bay is polluted.
- Write students’ responses on the board. *(Examples: 鸡场，工厂，房屋，城市，空气污染)*
- Invite one or two students to the front of the room. They will check off the items on the list as they occur in the video.

**During viewing:**
- Invite the class to raise their hands when one of their reasons is shown in the video.
- The student(s) in the front of the room will check off the reasons as their classmates raise their hands.

**After viewing:**
- Review the list of reasons.
- Add any additional reasons from the video.
- Prompt students to suggest solutions.
- Write the solutions on the board.

Finish the second part of the video, starting at 1.25 minutes.

T: 录像上说“我们需 要你”。但 在我们探讨解决方法之前，我们先看看问题的由来。

#### Exploring the problems
Arrange four stations for this small group activity.
- Each station will need a computer with speakers or headphones and Internet access so that students can view and listen to short videos.
- Each station should have a video pre-loaded (ideally 3 minutes or less) about one of the following topics. *(See Resource 4a for sources.)*
  - 养鸡场
  - 雨水径流
  - 空气
  - 房屋和工厂
- *(If computers and/or videos are not available, provide a set of photographs for each topic.)*
- Provide bookmarks of websites for students to visit. *(See Resource 4a.)*
- Distribute Worksheet 4a for taking notes at each station.

T: 我们来看看海湾的污染的四大问题。我们先看短视频（或看照片。）然后把你所看到和听到的做笔记，讨论一下问题的影响以及可能的解决方法。
| **World Language-STEM MODULE COVERSHEET**  
<table>
<thead>
<tr>
<th>切萨皮克湾：一个大家庭的故事</th>
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<tbody>
<tr>
<td><strong>Assign students to teams of three or four.</strong></td>
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<tr>
<td><strong>Allow approximately five to seven minutes for each station, and then rotate the teams to the next station.</strong></td>
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<tr>
<td><strong>Continue until each team has visited each station.</strong></td>
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<tr>
<td><strong>Assist as needed.</strong></td>
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<tr>
<td><strong>Discuss their findings.</strong></td>
</tr>
</tbody>
</table>

T: 海湾最大的问题是什么？  
Students respond.  
T: 没错！海湾地区著名的是鸡场和农场。你知道马里兰州是美国第七大鸡肉生产地吗？我们会安排去参观一个养鸡场！

| **Explanation**  
|Students explain their understanding of concepts and processes.  
|New concepts and skills are introduced as conceptual clarity and cohesion are sought |
|**Down on the chicken farm** |

NOTE: If possible, take students to a chicken farm, or invite a chicken farmer to the class. If these options are not possible, show a video of a typical day at a chicken farm.  
T: 今天我们要去参观一个养鸡场。在我们出发之前，谁记得爷爷告诉丹尼有关鸡场的事？  
Review PPT 36-37.  
T: 我们把我们想问的问题记下来？  
Model questions include:  
- 你们有多少只鸡？  
- 你们的鸡场有多大？  
- 鸡吃什么？  
- 它们吃很多吗？  
- 一只鸡长大要多长时间？  
- 他们住在哪里？  
- 你们怎么处理它们的废物？  

Write the questions on the board.  
After the visit or video, discuss the answers to the questions.  
T: 我们学了很多关于污染常识！现在是采取行动的时候了！

| **Elaboration**  
|Activities allow students to apply concepts in contexts, and build on or extend understanding and skill. |
|**We can make a difference.** |

PPT 44  
Invite students to read the text on the slide.  
T: 我们能做些什么来帮助海湾？  
PPT 45-49  
Engage students in a discussion about solutions to the problems of the Bay.  
T: 现在我们第一件事情是要告诉别人我们学到了什么。我们可以把我们学的放在学校的网站，这样的话，很多人都可以看而且学到！  
Discuss ideas for the presentations. Examples:  
- 小品 文章  
- 电影/电子文稿与旁白/音乐  
- 海报
### World Language-STEM MODULE COVERSHEET

**切萨皮克湾：一个大家庭的故事**

- 视频
- 歌/说唱
- 小册子
- 其他

T: 我想你做的是选择从我们所做的列表中选择类型介绍。

- Divide students into groups of three according to their choice. Assign each group one of the issues: 鸡厂， 雨水径流，空气，房屋和工厂
- Instruct students to include the following information in their presentation: 问题／影响／解决方法
  - Share the Team Presentation Rubric. ([Resource 4b](#))
- Distribute materials needed for each group.
- Assist as needed.

<table>
<thead>
<tr>
<th>Evaluation</th>
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<tr>
<td><strong>Students assess their knowledge, skills and abilities. Activities permit evaluation of student development and lesson effectiveness.</strong></td>
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<tr>
<th>Solution...not pollution</th>
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</table>
| **Allow a few minutes for the groups to rehearse their presentations.**
- You may want to videotape the presentations.
- Encourage classmates to give feedback to each team.
- Refer to Resource 4b for a suggested rubric. |

### Teacher Reflections on Lesson 4 - Taking Action to Protect the Bay

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<th>What worked well?</th>
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## Lesson 5 of 5

### Final Performance Assessment

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<tr>
<th>Materials/Resources</th>
<th>Procedures</th>
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<td><strong>My Life in the Bay podcast:</strong> Students will record an animal biography in a computer lab or with a portable device. Students will then listen to several of their classmates’ recordings and identify the animals described.</td>
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<td>• Place the flashcards from <strong>Worksheet 1c</strong> in a bag or container.</td>
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<td>• Instruct students to select one flashcard.</td>
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<td>• Distribute <strong>Worksheet 5a</strong>.</td>
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<td>• Display the following questions and allow five to ten minutes for students to take notes and to practice their recording.</td>
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<td></td>
<td>▪ 我长得是什么样子？</td>
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<td></td>
<td>▪ 我住在哪里？</td>
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<td></td>
<td>▪ 我吃什么？</td>
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<td></td>
<td>▪ 什么是我的猎物？</td>
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<td></td>
<td>▪ 谁是我的天敌？</td>
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<tr>
<td></td>
<td>▪ 为什么海湾的改变让我伤心？</td>
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<tr>
<td></td>
<td>▪ 谁能帮助我和海湾？</td>
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<tr>
<td></td>
<td>Instruct students to record their presentation, using their notes.</td>
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<tr>
<td></td>
<td>• After the recordings are completed, play several for the class and ask students to identify the animals.</td>
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<td><strong>Completion of 我的海湾之旅：</strong></td>
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<td>• Distribute students’ worksheets for assembling <strong>我的海湾之旅.</strong></td>
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<td>• Pair students and provide time for sharing.</td>
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## Teacher Reflections on Lesson 5 – Final Performance Assessment

<table>
<thead>
<tr>
<th>What worked well?</th>
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<table>
<thead>
<tr>
<th>What did not work well?</th>
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<th>What would I do differently?</th>
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<table>
<thead>
<tr>
<th>Other comments or notes</th>
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