Target Language: 中文  Grade Level: 4 and 5
Proficiency Level: Junior Novice Low – Junior Novice Mid
Enduring Understanding: Humans interact daily with their natural environment and over time, their actions affect the Earth.

Essential Question:
What can communities do to sustain their lifestyle while protecting natural resources and the environment?

Module Duration and Lessons:
Lesson 1: 能源岛在哪裡？
Lesson 2: 一个人可以改变一切吗？
Lesson 3: 自然界给了我们哪些能源和燃料？

Context and Storyline: Through the story called Energy Island, students will examine how the island of Samsø in Denmark became energy independent. They will learn how energy and fuels that we use every day come from natural resources, some renewable and some non-renewable. Students will learn the steps that Maryland and the United states are taking become more energy-independent.

NOTE: This module is based on the book, Energy Island. You may choose to read the story directly from the book, and/or tell the abbreviated story using the PowerPoint presentation provided. Throughout the lessons in this module, the page numbers of Energy Island are referenced using the notation, [p.__.]

Standards Targeted

<table>
<thead>
<tr>
<th>NGSS/STEM Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>NGSS</td>
</tr>
<tr>
<td>• Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment (4-ESS3-1).</td>
</tr>
<tr>
<td>• Obtain and combine information about ways individuals and communities use science ideas to protect the Earth’s resources and environment (5-ESS3-1).</td>
</tr>
<tr>
<td>STEM</td>
</tr>
<tr>
<td>• Apply integrated science, technology, engineering, and mathematical content to answer complex questions, to answer global issues, and to develop solutions for challenges and real world problems (2B).</td>
</tr>
<tr>
<td>• Communicate effectively and precisely with others (3F).</td>
</tr>
<tr>
<td>• Ask questions to identify and define global issues, challenges and real world problems</td>
</tr>
</tbody>
</table>
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:
  - Learners access and evaluate information and diverse perspectives that are available through the language and its cultures.

Knowledge: Students will know...
Skills: Students can...

<table>
<thead>
<tr>
<th>Vocabulary (both linguistic and content areas)</th>
<th>I can: Oral language:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content obligatory language:</td>
<td></td>
</tr>
<tr>
<td>- 能源</td>
<td>Say what wind turbines do</td>
</tr>
<tr>
<td>- 风车</td>
<td>Describe Samsø, Denmark, and compare it to Maryland</td>
</tr>
<tr>
<td>- 风力发电机组</td>
<td>Say what people in Samsø, Denmark like to do and compare those activities to what people in Maryland like to do</td>
</tr>
<tr>
<td>- 不可再生</td>
<td>Give examples of nonrenewable energy</td>
</tr>
<tr>
<td>- 可再生能源</td>
<td>Say how people like me can save energy</td>
</tr>
<tr>
<td>- 能源</td>
<td>Identify different members of a community</td>
</tr>
<tr>
<td>- 油</td>
<td>Identify how people used renewable resources</td>
</tr>
<tr>
<td>- 阳光/太阳能/太阳能电池板</td>
<td></td>
</tr>
<tr>
<td>- 水/水电</td>
<td></td>
</tr>
<tr>
<td>WORLD LANGUAGES/STEM MODULE COVERSHEET</td>
<td></td>
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<tr>
<td>---------------------------------------</td>
<td>---</td>
</tr>
<tr>
<td>能源历险记</td>
<td></td>
</tr>
</tbody>
</table>

- 秸秆/生物质
- 天然气
- 煤
- 风
- 稻草
- 生物质燃料
- 油菜籽

**Content compatible language:**
- 丹麦
- 大西洋
- Kattegatt 海
- 岛屿
- 风
- 农场
- 牛
- 羊
- 作物
- 开灯
- 打开加热器
- 使用热水
- 平均
- 驾驭
- 社区
- 马里兰州
- 美国
- 预测
- 改变你的想法
- 风暴
- 电力
- 电工
- 发生
- 假装
- 游客
- 会议

**Expressions**
- Hold on to your hats!
- I can save energy when I...
  - 开窗
  - 关灯
  - 回收汽水罐
  - 关水
  - 使用布袋买菜
  - 快速淋浴

- Identify renewable and nonrenewable resources
- Tell the main ideas in the story of Samsø
- Tell people how Maryland can become energy independent
- Compare Samsø to the state of Maryland

**Literacy**
- Distinguish main title from subtitle by size of print
- Identify root words
- Locate Samsø Denmark, on a world map
- Read and interpret a pie chart about energy use in the United States
- Make predictions about what will happen in the story based on what we know so far
- Read a pie chart showing use of renewable and nonrenewable resources in Maryland
- Identify a beginning, middle, and end to a story
- Write a beginning, middle, and end to a story

**STEM and other Subject Areas:**
- Recognize that energy and fuels that humans use are derived from natural resources
- Identify how humans use energy in their daily lives
- Identify natural resources that are nonrenewable
- Describe energy independence
- Identify renewable and nonrenewable natural resources
- Compare how much renewable and nonrenewable resources the United States uses
- Give a simple explanation of how nonrenewable resources cause global warming
- Name renewable and nonrenewable resources
- Compare renewable to nonrenewable resources used in Maryland
- Show how renewable energy can be used today
### Integrated Performance Assessments

#### Interpretive Task
Students will listen to statements related to natural resources and identify the image that is described.

#### Presentational Task
Working with a group, students will create and present a family from Samsø in the method of their choice.

#### Interpersonal Task
Students will share how they can change their behaviors to become more energy-responsible.

### Materials/Resources:
- 能源岛 by Allan Drummond
- PowerPoint
- a hat
- paper or cardstock (one 4”x 4” and one 8”x 8” per student)
- unsharpened pencils with erasers (two per student)
- straight pins (two per student)
- scissors (one pair per student)
- crayons and markers
- electric fan or blow dryer
- 10 large cookies
- 2 dinner plates
- game markers for board game (one per student)
- one die for each group of students
- poster paper
- markers
- video recording device
- computer with Internet access
- Resource 1a: 纸风车
- Resource 1b: Rubric for Presentations
- Worksheet 1a: 所有关于能源
- Worksheet 1b: 风车实验
- Worksheet 1c: 可再生与不可再生资源
- Worksheet 1d: 马里兰州的自然资源
- Worksheet 1e: 自然资源概况
- Worksheet 2a: 为什么饼干像是自然资源？
- Worksheet 2b: 美国的自然资源
- Worksheet 2c: 地球遊戲
- Worksheet 2d: 節約能源
STEM Background for Teachers:

**Renewable resources** such as sunlight, air, and wind, are resources that are continuously available, can be replenished naturally, and whose quantity is not noticeably affected by human consumption. Though many renewable resources do not have such a rapid recovery rate, they are susceptible to depletion by over-use. Resources are classified as renewable only so long as the rate of replenishment or recovery exceeds that of the rate of human consumption.

Non-renewable resources such as coal, oil, and natural gas, are finite resources that are not renewable at a sustainable rate based on current human consumption. Minerals and fossil fuels are the most common non-renewable resource.

A significant amount of offshore **wind energy** potential exists on the Atlantic coast. The offshore wind power could generate at least 36 percent of Maryland’s current electricity generation, displace about 23.7 million metric tons of carbon dioxide, and power approximately 1.6 million average homes annually. Maryland’s electricity generation created 29.1 million metric tons of carbon dioxide in 2008. Carbon dioxide is a greenhouse gas that can cause climate change and ocean acidification. Burning fossil fuels, like coal, oil, and natural gas causes climate change and ocean acidification.

Source: [http://oceana.org/sites/default/files/Maryland_0.pdf](http://oceana.org/sites/default/files/Maryland_0.pdf)

Maryland’s General Assembly passed the Maryland Offshore Wind Energy Act of 2013. The bill provides $1.5 billion, incentivizing projects like the construction of 40 turbines 10 miles off the coast of Ocean City and requiring 20% of Maryland’s electricity to come from renewable sources. In addition to powering a third of the homes on Maryland’s Eastern Shore, this 200-megawatt project could generate 850 jobs in manufacturing and construction and reduce carbon dioxide emissions by upward of 378,000 tons per year. The same day the Wind Energy Act passed in Maryland, Charles County Commissioner Ken Robinson was the hosts at a ribbon-cutting ceremony celebrating the Renewable Energy Center at Crain Memorial Welcome Center, a tourist rest stop on US 301 near the Potomac River. A 12-kilowatt turbine there will fuel an electric car-charging station and assist in keeping the center off the grid. A destination in itself, the project is the first of its kind in Maryland and one of a handful globally.

Source: Written by Sierra Gladfeller for Bay Journal News Service April 14, 2013
**Lesson 1- Where is Energy Island?**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>I Can:</th>
</tr>
</thead>
</table>
| **Oral language:** | Say what wind turbines do  
| | Describe Samsø, Denmark, and compare it to Maryland  
| | Say what people in Samsø, Denmark like to do and compare those activities to what people in Maryland like to do  
| | Give examples of nonrenewable energy |
| **Literacy** | Distinguish main title from subtitle by size of print  
| | Identify root words  
| | Locate Samsø, Denmark on a world map |
| **STEM and Other Subject Areas:** | Recognize that energy and fuels that humans use are derived from natural resources  
| | Identify how humans use energy in their daily lives  
| | Identify natural resources that are nonrenewable  
| | Describe energy independence |

| Content obligatory language: |  
| | 自然资源  
| | 风车  
| | 风力发电机  
| | 不可再生  
| | 再生能源  
| | 能源 |
| **Content compatible language:** |  
| | 丹麦  
| | 大西洋  
| | Kattegatt 海  
| | 岛  
| | 风  
| | 农场  
| | 牛  
| | 羊  
| | 作物  
| | 开关灯  
| | 暖器  
| | 热水  
| | 平均 |

**Expressions**  
- 捏紧你的帽子！
Lesson Storyline

Students will visit Samsø, Denmark, through the story of *Energy Island* to learn how the people of the community lived. They will meet Søren Hermansen, who led the effort to make Samsø almost completely energy independent with the help of the wind. Their example shows the potential for Maryland to become more energy independent through initiatives to build a wind farm off the coast of Maryland.

*NOTE:* This module is based on the book, *Energy Island.* You may choose to read the story directly from the book, and/or tell the abbreviated story using the PowerPoint presentation provided. Throughout the lessons in this module, the page numbers of *Energy Island* are referenced using the notation, [p.__.]

### Materials/Resources
- *Energy Island* by Allan Drummond pages 1 - 11
- PowerPoint presentation slides 1-24
- **Resource 1a:** 如何做风车
- **Resource 1b:** Rubric for Presentations
- **Worksheet 1a:** 什么是能源？
- **Worksheet 1b:** 风车实验
- **Worksheet 1c:** 可再生与不可再生资源
- **Worksheet 1d:** 马里兰州的自然资源
- **Worksheet 1e:** 自然资源概况
- a hat
- 4”x 4” square piece of paper or cardstock (one per student)
- 8”x 8” square piece of paper or cardstock (one per student)
- unsharpened pencils with erasers (two per student)
- straight pins (two per student)
- scissors (one pair per student)
- ruler (one per student)
- crayons and markers
- electric fan or blow dryer

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

**PPT 1 [cover]**

T: 你看到了什么？岛是什么？
Students respond.
T: 握紧你的帽子是什么意思？(Teacher puts hat on head and holds on to it).
T: 为什么要握紧你的帽子？(When it is windy).
T: 能源历险记又要告诉我们什么？
Students respond.
### PPT 2-5
T: 我们今天将从大西洋到一个岛上。
Invite students to read the text on the slides.
让学生参与讨论有关的地点：欧洲，大西洋，丹麦，Kattegatt海，萨姆索岛

### PPT 6 [p.2]
Invite a student to read the text on the slide.
T: 在我们读能源岛故事之前，我们来谈谈什么是能源从哪里来？

### PPT 7
T: 能源来自自然资源。什么是自然资源？(Prompt students with “nature” and give an example.)
T: 自然资源是自然界产生的东西。我们每天都在使用自然资源。
Students respond.
T: 树木，太阳，风，水，土地和植物都是自然资源。煤和石油也是自然资源。你们知道哪些自然资源比较容易得到？
Students respond.

T: 我们如何使用它们？ (Prompt if necessary: lights, heat, cars, hot water, etc.)
Students respond.
T: 没错！自然资源给我们的能量，我们日常生活用的的灯，房子和汽车的能量都是从自然资源来的。

Distribute Worksheet 1a.
Assist students as needed.
收集作业，并放在“握紧你的帽子！”学生的档案夹里

### PPT 8 [cover]
T: 现在，我们来看看这本书的封面。你看到了什么？它的标题是什么？
Students respond.

T: 萨姆索的天气怎么样？
Students respond.
T: 为什么它看起来有风？（头发吹，风车在转）
T: 萨姆索的故事是关于如何用风来发电。他们为什么要用风来发电？

### PPT 9
T: 丹麦的风力发电机是世界上最大的生产商之一。有没有人见过风力发电机？
Students respond.
T: 风力发电机由风力产生能量。
PPT 10 [cover]
T: 现在，我们再来看看这本书其它部分的标题。这本书的副标题是什么？

Students respond.
T: 这是什么意思：社区怎么利用的风来改变他们的生活？(You may need to explain “harnessed” using a more familiar word like “caught.” Emphasize the end of the title: ...改变他们的世界.)
Students respond.
T: 我们来看看萨姆索人怎么利用风力使能量改变了他们的世界。

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

制作风车
词汇介绍：风车，旋转，吹

T: 我们今天要做我们自己的风力发电机， 这个风力发电机要和能源岛上大的风力发电机是一样可以用风来产生能源，不过比较小。

PPT 11-14
- Model the construction of a pinwheel.
- Distribute Resource 1a, one sheet of plain paper, a ruler, a pencil with an eraser, and scissors to each student.
- Distribute the straight pins or when students have cut out their two pinwheel patterns.
- Assist students as needed.

T: 你有两个风车，这是小的风力发电机，你的风车可以旋转吗？Demonstrate.
NOTE: For the next step, students take the pinwheels outdoors and test them on a windy day. If this is not possible, provide a fan or hair dryer to simulate the wind.

T: 我们去户外在自然风下使我们的风车旋转？

Instruct students to experiment with their two pinwheels. (4” and 8”)
For example:
- 把你的风车远离风会有什么变化？
- 当你把你的风车放在不同的方向会发生什么事？
- 如果你把你的风车紧贴地面会怎么样？
- 如果你把你的风车举高会发生什么？

Provide sentence starters such as:
- 当我的风车_____，它的动作快。
- 当我的风车_____，它的动作小。
- 当我从_____，我的风车吹至_____。
能源历险记

- （正面，侧面，右，左。）
- 我的风车会/不会旋转。

Return to the classroom. Engage students in conversation about their findings.

T: 什么时候风车旋转最快？

T: 什么时候风车不转动呢？

Students respond.

Distribute Worksheet 1b and assist students in the completion of #1 and #2.

T: 我们的风车就像是小型的风力发电机。当风力发电机遇到时，他们加速旋转，产生能量。

T: 让我们来比较一下我们的风力发电机和真正的风力发电机。

Show a brief video (available online) of a wind turbine and discuss how it compares to the pinwheels.

Discuss the findings.

Assist students in answering #3 on Worksheet 1b.

收集作业，并放在“握紧你的帽子！”学生的档案夹里

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

Renewable vs. Nonrenewable Resources

Vocabulary introduced: renewable, nonrenewable, corn, straw, trees, water, natural gas

PPT 15 [cover]

T: Let’s go back to Samsø and read the beginning of the story to see why it is called Energy Island.

PPT 16-18 [pp. 6-7]

Invite students to read the text on the slides. Use the visuals on the slides to engage students with the vocabulary with questions such as:

- 我们用相同的资源吗？
- 石油是一种自然资源吗？
- 灯是用什么能源？
- 家的暖气从哪儿来？
- 车的油是从哪儿来？

Students respond.

PPT 19-22 [pp. 7-11]

T: 我们来看看萨姆索岛发生了什么事。（Invite several students to read the text on the slides. Use gestures and/or visuals to convey meaning if necessary.）
能源历险记

| T: 你觉得我们可以在这里做一些事吗？  
Students respond. |
| T: 有人建议用风力制造能源。利用风和用油有什么差别吗？  
Students respond. |
| T: 没错！风是免费的，萨姆索有很多风。风被称为可再生的自然资源。有些自然资源是不可再生的。它们有什么不一样？  
Write 自然资源 on the board. Then draw two columns underneath and label them 再生的天然资源 and 不再生的天然资源  
T: 可再生资源是用不完的资源。如太阳，风，及作物，它们可以很容易地被替换。  
T: 不可再生资源会用完，且不能被替换。它们是造百万年前创造的，如地面上的天然气，石油和煤炭。（Display the visuals and invite students to place each in the correct column on the board）  
Distribute Worksheet 1c.  
T: 可再生的资源画个圈，不可再生的资源画个 X。然后标记每个资源。  
Assist students as needed. |

| PPT 23：_______是 _______资源。  
收集作业，并放在“握紧你的帽子！”学生的档案夹里 |

| Elaboration  
Activities allow students to apply concepts in contexts, and build on or extend understanding and skill. |
| 马里兰州的自然资源 |

NOTE: If computers are not available, print the individual fact sheets for each group from the Maryland’s Energy Commission’s website: http://energy.maryland.gov/home.html  
Students will read the information in English and complete the worksheet in the target language.  

PPT 24  
T: 我们已经了解了可再生和不可再生资源。我们可以找出更多关于马里兰州的资源呢？  
Discuss and chorally repeat the percentages for each resource on the slide.  
* 将学生分成八组：煤炭，天然气，核电，石油，太阳能，生物能，风能，地热采暖和制冷  
* Distribute Worksheet 1d as a note-taking organizer.  
* Allow approximately 15 minutes for students to find the information on the worksheet.  
* Assist the groups as needed and check for comprehension. |
<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Presentations of Maryland’s Renewable vs. Nonrenewable Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students assess their knowledge, skills and abilities. Activities permit evaluation of student development and lesson effectiveness.</td>
<td>• Allow five to ten minutes for the groups to practice their presentations.</td>
</tr>
<tr>
<td></td>
<td>• Distribute Worksheet 1e for the students to take notes as they watch and listen to the presentations. Remind students that they do not need to write everything that is presented; but rather only one interesting fact in the right column.</td>
</tr>
<tr>
<td></td>
<td>• Use Resource 1b to assess the presentations.</td>
</tr>
</tbody>
</table>

**Teacher Reflection Lesson 1**

<table>
<thead>
<tr>
<th>What worked well?</th>
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</table>

<table>
<thead>
<tr>
<th>What did not work well?</th>
</tr>
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<tbody>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>What would I do differently?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Other comments or notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>
Lesson 2- How can one person make a difference?

### Objectives

<table>
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<tr>
<th>I Can:</th>
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<tbody>
<tr>
<td>Oral language:</td>
</tr>
<tr>
<td>• Say how I can save energy</td>
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</table>

<table>
<thead>
<tr>
<th>Literacy:</th>
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<tbody>
<tr>
<td>• Read and interpret a pie chart about energy use in the United States</td>
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<tr>
<td>• Identify ways my family can save energy every day</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>STEM and Other Subject Areas:</th>
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</thead>
<tbody>
<tr>
<td>• Identify renewable and nonrenewable natural resources</td>
</tr>
<tr>
<td>• Compare renewable and nonrenewable resource usage between Maryland and the United States</td>
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</table>

### Vocabulary and Expressions

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<th>Content obligatory language:</th>
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<tbody>
<tr>
<td>• 油</td>
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<tr>
<td>• 太阳</td>
</tr>
<tr>
<td>• 水</td>
</tr>
<tr>
<td>• 秸秆/生物质</td>
</tr>
<tr>
<td>• 天然气</td>
</tr>
<tr>
<td>• 煤</td>
</tr>
<tr>
<td>• 风</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Content compatible language:</th>
</tr>
</thead>
<tbody>
<tr>
<td>我可以节省能量，当我...</td>
</tr>
<tr>
<td>• 打开窗户。</td>
</tr>
<tr>
<td>• 关灯。</td>
</tr>
<tr>
<td>• 回收汽水罐。</td>
</tr>
<tr>
<td>• 关掉水。</td>
</tr>
<tr>
<td>• 使用布袋买菜。</td>
</tr>
<tr>
<td>• 采取快速淋浴。</td>
</tr>
<tr>
<td>• 关掉电视。</td>
</tr>
<tr>
<td>• 骑我的自行车。</td>
</tr>
<tr>
<td>• 使用节能灯泡。</td>
</tr>
<tr>
<td>• 回收报纸。</td>
</tr>
<tr>
<td>• 关门。</td>
</tr>
<tr>
<td>• 拔出电子设备。</td>
</tr>
</tbody>
</table>

### Materials/Resources

- *Energy Island* by Allan Drummond [pp.12 – 19]
Lesson Storyline

Mr. Hermansen has the support of his students, but he has to convince the people who live in Samsø that energy independence is a good idea. That takes time and a lot of talking. He finally convinces two citizens to try wind energy.

NOTE: This module is based on the book, Energy Island. You may choose to read the story directly from the book, and/or tell the abbreviated story using the PowerPoint presentation provided. Throughout the lessons in this module, the page numbers of Energy Island are referenced using the notation, [p.__.]

Key Elements

<table>
<thead>
<tr>
<th>Engagement</th>
<th>Lesson 2 Procedures</th>
</tr>
</thead>
</table>
| **Object, event or question used to engage students.**
**Connections facilitated between what students know and can do**

**PPT 24**

T: 你们知道马里兰和萨姆索岛使用相同的资源吗？

词汇介绍：能源独立。

Students respond.

T: 事实上，马里兰的州政府正在马里兰州海岸的大西洋边提倡大型风力电力机项目。这将需要很多年才能完成。让我们再回到我们故事里关于萨姆索岛的故事。

**PPT 25-26 [pp. 12-13]**

T: 满森先生和他的学生们非常兴奋风能。但大人呢？

Invite students to read the text on the slides.

T: 跟你的同学讨论一下，一个新的计划要多久才会有人同意你？你记不记得当你有一个新的想法，需要多少时间才能说服家人和朋友？ (Provide an example, if necessary.)

**PPT 27 [pp. 14-15]**

Invite students to read the text.
## Key Elements

<table>
<thead>
<tr>
<th>Lesson 2 Procedures</th>
</tr>
</thead>
</table>
| T: 什么是“能源独立？”
Students respond.
T: 没错！能源独立就是我们自己创造能量。我们想想，马里兰州可以能源独立吗？ |

### PPT 28 [pp. 16-19]
T: 让我们再回到我们的故事里关于萨姆索岛的故事。终于有一天萨姆索岛上两个人决定试一试新的能源计划。

Invite students to read the text on the slide.
T: 你们知道为什么吗？

Students respond.
T: 因为，一个是想为他的家建一个小型风力发电机，另一个希望在他的农场上建个大的风力发电机来赚钱。

---

## Exploration

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

<table>
<thead>
<tr>
<th>Exploration</th>
</tr>
</thead>
</table>
| T: 假设这个饼干是一种不可再生的资源。
Hold up a cookie.
T: 假设这个饼干是一种不可再生的资源。
Invite two students to come to the front of the class and give then a plate with two cookies on it
T: 如果这两个学生要共享的不可再生资源，一个学生可以得到多少饼干？
Students respond.
T: 是的，一人一个饼干。
Invite two more students to come up to the front of the class and join the first two students.
T: 如果四个学生要共享的不可再生资源，一个学生可以得到多少饼干？
Students respond.
T: 是的，一人半个饼干。
Students respond.
Invite four more students to come up to the front of the class.
T: 如果八个学生要共享的不可再生资源，一个学生可以得到多少饼干？
Students respond.
T: 是的，一人四分之一饼干。
Students respond. |
### Key Elements

| T: 所以饼干怎么了？ | Students respond. |
| T: 越多的人共享相同的资源，每一个得到饼干越少。就像世界上的自然资源：越多的人用，每个人的资源也越少。 |

### Procedures

#### T: 所以饼干怎么了？

Students respond.

T: 越多的人共享相同的资源，每一个得到饼干越少。就像世界上的自然资源：越多的人用，每个人的资源也越少。

**Distribute Worksheet 2a.**

Complete Parts 1 and 2 with the class.

**T: 当一组/国家比另一组/国家更多的人，会发生什么？**

T: 现在让我们把饼干平分给每个人，大家一起来吃饼干！

- Divide students into two unequal groups: one with four students, and the other with the rest of the class.
- Give each group a plate with 4 cookies.
- Instruct students to divide the cookies and complete Part 3 of the worksheet.
- Assist as needed.

**After students have completed the experiment:**

T: 如果饼干代表地球上的不可再生资源。什么是这个实验告诉我们了什么？如果我们饼干吃完了，我们还有饼干吗？

Students respond.

T: 是的！越多人使用资源，这些资源是不可再生的---我们不能代替他们。这就是为什么萨姆索和马里兰州正在找可用可再生资源，能源独立，不必担心用完能源的一天。

### Explanation

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

### Comparing Resources of Maryland and the United States

**T: 美国利用再生资源和马里兰州一样不一样？**

**PPT 29**

- Review Maryland’s resources.
- Allow students to discuss the two infographs with partners.
- **Distribute Worksheet 2b.**
- Direct students to complete the worksheet with partners or in small groups.
- Assist as needed.
- Review students’ responses on the worksheet, and use additional statements such as:
  - 马里兰使用更多的________超过美国。
  - ________使用更多的可再生资源超过________。
<table>
<thead>
<tr>
<th>Key Elements</th>
<th>Lesson 2 Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• 马里兰州和美国都需要使用更多的______收集作业，并放在“握紧你的帽子！”学生的档案夹里。</td>
</tr>
</tbody>
</table>

**Elaboration**

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

怎样能减少能源消耗？

词汇介绍：节省能源，开窗，关灯，回收汽水罐，用布袋买菜，快速淋浴，关掉电视，骑自行车，使用节能灯泡，回收报纸，关门，拔掉电子设备。

**NOTE:** Prepare the game cards and board (Worksheet 2c) for each group of four students.

T: 我们了解到，美国使用不可再生资源比使用可再生的资源多。怎样能减少能源消耗？

**PPT 30-34**

Invite students to read the text on the slides.

**PPT 35**

T: 你每一天用什么类型的设备？（手机，平板电脑，游戏机）

Students respond.

**PPT 36**

T: 我们可以做什么节约能源？

As students respond, document and display their responses.

T: 这些想法都很好！我们来用游戏练习怎样能节约能源

用手势重并在玩地球赛重复下列词语。（You may wish to display these expressions for student reference.）

• 轮到你了。
• 滚动骰子。
• 向前移__步。
• 后退__步。

Display and review the game cards to ensure comprehension.

Model as you give the directions for the Planet Earth game.

• 洗牌后，然后将它们面朝下放。
• 将标记放在START。
• 轮流丢骰子。
• 如果你的骰子走到地球人，抽一张牌，大声读出来，并按照指示。
• 第一个人到达风力发电机组获胜！

Distribute the dice, game board and cards.

Assist as needed, encouraging students to use the expressions and to
**Key Elements**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson 2 Procedures</strong></td>
<td>read aloud the directions on the cards in the target language.</td>
</tr>
</tbody>
</table>

**Evaluation**

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

**Distribute Worksheet 2d.**

Use the following script to assess students’ listening skills in identifying energy-saving practices:

1. 当我离开房间，我关掉电视。
2. 当我用完完毕，我拔掉我的电子设备。
3. 我节约用水，缩短淋浴时间。
4. 天气晴朗时，我打开窗户。
5. 我回收瓶，罐和纸。
6. 我用布袋购物。

**Teacher Reflections on Lesson 2**

<table>
<thead>
<tr>
<th>What worked well?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>What did not work well?</td>
<td></td>
</tr>
<tr>
<td>What would I do differently?</td>
<td></td>
</tr>
<tr>
<td>Other comments or notes.</td>
<td></td>
</tr>
</tbody>
</table>
Lesson 3 - Our Natural Resources Give Us Energy and Fuel

**Objectives**

<table>
<thead>
<tr>
<th>I Can:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oral language:</strong></td>
</tr>
<tr>
<td>• Identify how people used renewable resources</td>
</tr>
<tr>
<td><strong>Literacy:</strong></td>
</tr>
<tr>
<td>• Make predictions about what will happen in the story based on what we know so far.</td>
</tr>
<tr>
<td>• Read a pie chart showing use of renewable and nonrenewable resources in Maryland</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STEM and Other Subject Areas:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Name renewable and nonrenewable resources</td>
</tr>
<tr>
<td>• Compare renewable to nonrenewable resources used in Maryland</td>
</tr>
</tbody>
</table>

**Vocabulary and Expressions**

<table>
<thead>
<tr>
<th>Content obligatory language:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 太阳能电池板</td>
</tr>
<tr>
<td>• 稻草</td>
</tr>
<tr>
<td>• 生物质燃料</td>
</tr>
<tr>
<td>• 油菜籽</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Content compatible language:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 预测</td>
</tr>
<tr>
<td>• 改变你的想法</td>
</tr>
<tr>
<td>• 风暴</td>
</tr>
<tr>
<td>• 电力</td>
</tr>
<tr>
<td>• 电工</td>
</tr>
<tr>
<td>• 发生</td>
</tr>
<tr>
<td>• 假装</td>
</tr>
<tr>
<td>• 游客</td>
</tr>
<tr>
<td>• 会议</td>
</tr>
</tbody>
</table>

**Materials/Resources**

- 能源岛 by Allan Drummond pages 20 - 27
- PowerPoint presentation slides 37-50
- poster paper
- markers
- video recording device
- computer with Internet access
- **Resource 3a:** Samsø Identification Cards
WORLD LANGUAGES/STEM MODULE COVERSHEET
能源历险记

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
|   | o Resource 3b: Family Presentation Rubric  
|   | o Worksheet 3a: 我的萨姆索家庭  
|   | o Worksheet 3b: 和我的家人见面  

Lesson Storyline

After a storm hits Samsø and almost everyone loses electricity (except for the farmer and electrician), the town decides that renewable energy is a good idea. Now, everyone gets involved.

NOTE: This module is based on the book, Energy Island. You may choose to read the story directly from the book, and/or tell the abbreviated story using the PowerPoint presentation provided. Throughout the lessons in this module, the page numbers of Energy Island are referenced using the notation, [p.____.]

Key Elements

<table>
<thead>
<tr>
<th>Engagement</th>
<th>Lesson 3 Procedures</th>
</tr>
</thead>
</table>
| Engagement   
  - Object, event or question used to engage students.  
  - Connections facilitated between what students know and can do  
|   | One Dark and Stormy Night... |
| T: 满森先生怎么介绍用可再生能源？谁决定尝试风能？  
(Refer to PPT 28, if necessary.)  
T: 是的，一个电工和一个农夫  
| PPT 37 [pp. 20-21]  
Invite a student to read the text on the slide.  
T: 后来又发生了什么，改变萨姆索人的想法？  
Students respond.  
| PPT 38 [pp. 20-21]  
T: 是的，萨姆索有一个风暴，然后呢？  
Students respond.  
T: 是的，有没有电 - 没有灯，没有电视，没有热量。  
| PPT 39 [p. 22]  
T: 这就是发生在萨姆索情形，但是有一个例外。  
Invite a student to read the text on the slide.  
T: 为什么电工的家仍然有灯光和热？  
Students respond.  
| PPT 40 [p.23]  
Invite students to read the text on the slide.  
T: 如果你住在萨姆索，你会怎么做？  
Students respond. Discuss energy solutions.  

Exploration

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
|   | 萨姆索岛的家庭  

# WORLD LANGUAGES/STEM MODULE COVERSHEET

## 能源历险记

<table>
<thead>
<tr>
<th>Key Elements</th>
<th>Lesson 3 Procedures</th>
</tr>
</thead>
</table>
| enslaved phenomena are explored. ● Hands-on activities, with guidance. | **PPT 41-45 [p.24]**  
T: 让我们来看看萨姆索的人怎么能能源独立。  
Invite students to read the text on the slides. Use choral repetition, visuals, and gestures to convey meaning.  
**PPT 46-50 [pp. 25-31]**  
Invite students to read the text on the slides.  
T: 所以，现在大家都知道萨姆索岛！世界各地人们来到萨姆索，看看他们可以为自己的社区做什么。  

T: 现在我假装我们住在萨姆索岛。世界各地的游客来我们岛上参加能源会议。  

Distribute one identification card to each student from Resource 3a.  
T: 这里是你的新身份证。这上面有你的：名字，工作，家人，和你的住址。  

Distribute Worksheet 3a.  
T: 我要你们现在坐下来与你的新家人谈谈和练习你将如何介绍你的家人给我们的游客。例如：  
- 你是谁  
- 我是_____的女儿。  
- 我十六岁。我是一名学生。  
- 我们生活在_____。（市）  
- 我们用____能源资源。  
- 想想你的年龄和你怎样节约能源。  
- 别忘了听你的家庭成员自我介绍，顺便记笔记此工作表上。  

Assist as needed.  
Allow ten minutes for the families to practice their presentations.  
收集作业，并放在“握紧你的帽子！”学生的档案夹里. |

<table>
<thead>
<tr>
<th>Explanation</th>
<th>Preparing for the Energy Conference Interviews</th>
</tr>
</thead>
</table>
| ● Students explain their understanding of concepts and processes.  
● New concepts and skills are introduced as conceptual clarity and cohesion are sought. | T: 现在来我们试试，如果你在路上遇见了游客，你如何解释你家或是学校的能源独立。  
- First, instruct the families to introduce themselves to another family that uses the same energy source.  
- Next, instruct students to find a person of the other family that is of a similar age.  
- Refer students to their Worksheet 1e as a starting point.  
- Provide the following link (or print the necessary fact sheets) that was used for the worksheet:  
  [http://energy.maryland.gov/home.html](http://energy.maryland.gov/home.html) |
### Key Elements

<table>
<thead>
<tr>
<th>Lesson 3 Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>• After 10-15 minutes, direct students to return to their own family and share their information.</td>
</tr>
<tr>
<td>• Allow 10-20 minutes for the families to discuss their information and to create a visual for their interviews.</td>
</tr>
<tr>
<td>• Distribute poster paper, markers and/or colored pencils.</td>
</tr>
</tbody>
</table>

### Elaboration

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

采访萨姆索的家庭

Allow 10 minutes for the families to practice their answers for their interview.

T: 明天是我们的能源会议的第一天！将有很多游客来萨姆索岛，了解我们！每个家庭将在会议上分享您的故事。你可以用各种方法来分享您的故事：例如：

- 演讲介绍
- 演示文稿
- 电影
- 每个家庭成员都必需参加

### Evaluation

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

Energy Conference Showtime

Allow approximately five minutes for the families to practice and set up their presentation.

Distribute **Worksheet 3b** and instruct students to assess each presentation using the rubric.

Use **Resource 3b** to assess each presentation.

收集作业，并放在“握紧你的帽子！”学生的档案夹里.

### Teacher Reflections on Lesson 3

<table>
<thead>
<tr>
<th>What worked well?</th>
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<tbody>
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<td></td>
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</table>

<table>
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