Mapping and Identifying Landforms

Grade Level
2nd Grade

Benchmarks
2-ESS2-2
Develop a model to represent the shapes and kinds of land and bodies of water in an area.

- SEP: Developing and Using Models
  - Modeling K-2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represents concrete events or design solutions.
    - Develop a model to represent patterns in the natural world.
- DCI: Plate Tectonics and Large-Scale System Interactions
  - Maps show where things are located. One can map the shapes and kinds of land and water in any area.
- CCC: Patterns
  - Patterns in the natural world can be observed.

Objectives

- Students develop a model that identifies the relevant components, including components that represent both land and bodies of water in an area.
- In the model, students identify and describe relationships between components using a representation of the specific shapes and kinds of land and specific bodies of water within a given area.
- Students use the model to describe the patterns of water and land in a given area.
- Students describe that because they can map the shapes and kinds of land and water in any area, maps can be used to represent many different types of areas.
Materials and Setup

- **Engage: Google Earth Tour of Land and Water Features**
  - **Materials:** computer, projector
  - **Set-Up:** ‘Landforms and Water Feature’ google maps is opened up on computer and projected on board

- **Explore 1: Play Doh Landforms**
  - **Materials:** play-doh
  - **Set-Up:** pass out play-doh to each student

- **Explain 1: Google Earth Tour of Land and Water Features**
  - **Materials:** computer, projector, small whiteboards, whiteboard markers
  - **Set-up:** ‘Landforms and Water Feature’ google maps is opened up on computer and projected on board; pass out whiteboards and markers to each student

- **Explain 2: Land and Water Feature Poster Presentations**
  - **Materials:** poster board, markers

- **Explore 2: Salt Dough Mold**
  - **Materials:** landform mold, salt, flour, water, non-stick cooking spray, paint, paint brushes
  - **Set-Up:** pre-mix the dough for each group

- **Explore 3: Little Red Riding Hood Mapping Exercise**
  - **Materials:** ‘Little Red Riding Hood Map’ worksheet (page 15), computer, projector
  - **Set-Up:** pass out ‘Little Red Riding Hood Map’ worksheet to each student

- **Explain 3: Maps Powerpoint**
  - **Materials:** computer, projector
  - **Set-Up:** ‘Maps’ powerpoint is opened up on computer and projected on board

- **Elaborate: USA Water and Landform Map**
  - **Materials:** printed maps (page 19-23), ‘USA Water and Landform Map’ worksheet (page 17)
  - **Set-Up:** pass out ‘Maps’ powerpoint slides, ‘USA Water and Landform Map’ worksheet, and coloring utensils to each student
Procedure

Engage: (10 minutes) Google Earth Tour of Land and Water Features
- Click the link and project onto the board.
  https://drive.google.com/open?id=1KrwLzwNAxryV4JRL2xeRgygc_WZzYhkr&usp=sharing
- Click on each of the pins, zoom in (if needed) and ask the students if they know what kind of land or water feature is represented by the pin. Ask follow up questions such as:
  - Why do you think that?
  - What type of shape is this feature?
  - What types of land or water features are surrounding it?
  - How high or low (in elevation) is this feature compared to the surrounding area?

Explore 1: (15 minutes) Play Doh Landforms
- Instruct students to make their own interpretation of the landform out of play doh that is stated by the teacher.
  - Landforms that the students will create: peninsula, valley, mountain, island, volcano, lake, river, plateau.
  - After each landform is stated and the students have had adequate time to build their landform, ask them the following questions:
    - Why did you create this landform this way?
    - Is this an accurate representation of this landform?
    - How is the shape of this landform different from others?
  - Record the correct characteristics and shapes that students shared on the whiteboard and make a chart that students can visually see how each landform is different from another. This activity isn’t to stress the importance of specific characteristics but rather the general shape of the land or water feature. Below is an example of possible students answers and what you might draw on the board.
  - After discussing the shape of the land and water feature and recording the students ideas on the board, create an accurate representation of the landform with the play doh.
<table>
<thead>
<tr>
<th>Location</th>
<th>Definition</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peninsula</td>
<td>Body of land surrounded by water on 3 sides</td>
<td></td>
</tr>
<tr>
<td>Valley</td>
<td>Low area between mountains or hills</td>
<td></td>
</tr>
<tr>
<td>Mountain</td>
<td>Elevated surface that has steep sides and a peak</td>
<td></td>
</tr>
<tr>
<td>Island</td>
<td>A body of land surrounded by water</td>
<td></td>
</tr>
<tr>
<td>Volcano</td>
<td>Cone-shaped mountain that contains lava</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Lake</td>
<td>Body of water that is surrounded by land</td>
<td></td>
</tr>
<tr>
<td>River</td>
<td>Stream of water that flows between lakes, oceans, and other bodies of water.</td>
<td></td>
</tr>
<tr>
<td>Plateau</td>
<td>Elevated feature that contains a level surface</td>
<td></td>
</tr>
</tbody>
</table>
Explain 1: (10 minutes) Google Earth Tour of Land and Water Features

- Pass out whiteboards and whiteboard markers to each student.
- Click the link and project onto the board.
  https://drive.google.com/open?id=1KrwLzwNAXryV4JRL2xeRgygc_WZzYhkr&usp=sharing
- “We are going to revisit the Google Earth tour and using the information we have talked about in the previous activity let’s discuss how we can label and differentiate the various land and water features.”
- As you click on each of the locations, describe the locations with the descriptions and definitions listed below WITHOUT telling the name of the land or water feature.
- Ask the students to write the name of the land or water feature they think it is on their whiteboard and hold it up in the air. After students have responded, reveal correct answer.

**Answers:**

- **1- Peninsula (Florida)**
  - Piece of land extending from the mainland and surrounded by water on 3 sides.
- **2- Valley (Lotschental Valley, Switzerland)**
  - A low area that is located between mountains and hills.
  - V-Shaped: formed from erosion and rivers
  - U-Shaped: formed from the movement of glaciers
- **3- Mountain (Mount Kilimanjaro)**
  - Feature contains chunks of rock which rises significantly higher than the surrounding terrain.
  - Contains steep sides and a peak.
  - Can be found on land or underwater.
- **4- Island (Hawaii)**
  - An area of land, smaller than a continent, that is completely surrounded by water.
  - Can be surrounded by a sea, ocean, river, or lake.
- **5- Volcano (Mauna Loa, Hawaii)**
  - Cone shaped mountain that is formed from material (lava or pyroclast) that is emitted from Earth’s crust.
  - Located above and below sea level.
- **6- Lake (Lake Michigan)**
  - Body of water than is surrounded by land.
  - Get their water from rain or melted snow.
  - Usually freshwater..
- **7- River (Grand River, Michigan)**
  - The largest stream of water that flows through land and into lakes, oceans, or other bodies of water.
- **8- Plateau (Island in the Sky Plateau, Utah)**
  - Fairly level land on an elevated surface
  - Level surface caused erosion (wind and rain)
Explain 2: (20 minutes) Land and Water Feature Poster Presentations

- Break the class into groups of 8. Give each group a poster board and markers. Assign each group one of the land or water features (peninsula, valley, mountain, island, volcano, lake, river, plateau). They are responsible for creating a definition of this landform, adding all the information they know, and drawing a picture. Remind students to use the information they have gathered from the play doh and google earth activity to come up with their own definition. At the end of the given time, each group will present their poster to the class. Before the students begin writing on the poster board, make sure they get their definition and drawing approved by the teacher.

Explore 2: (5 minutes) Salt Dough Mold

- Explain to students that a physical map shows the earth’s geographical features. Divide class into small groups. For each group, prepare a salt and flour dough (2 cups flour, 1 cup salt, 1 cup water).
- Spray the landform mold with nonstick cooking spray. Have each group of students put their dough into the mold, then remove it and place it on a flat surface to dry. When all the molds have dried (2-7 days), allow students to paint them. Ask students to label each of the landforms shown.

*This activity was adapted from Landform & Mapping Resource Box*
Explore 3: (10 Minutes) Little Red Riding Hood Mapping Exercise

- Pass out worksheet ‘Little Red Riding Hood Map’ (page 8).
- "As I read this short story, draw a map of where the character is traveling. You do not need to draw the characters but rather the buildings, roads, water features and the various landforms we discussed. Remember, a map is a bird's-eye view. So your map should be be an overhead view."
- Project this image below onto the screen to show an example of what a birds-eye view might look like for a bedroom.

(http://marissadreambedroom.weebly.com/birds-eye-view.html)

*This activity was adapted from Landform & Mapping Resource Box*
“One day, Little Red Riding Hood’s mother said to her, “Take this basket of goodies to your grandma’s cottage (hint- grandma’s cottage is located in the bottom left of your map), but don’t talk to strangers on the way!” Promising not to, Little Red Riding Hood skipped off out her door (hint- Little Red Riding Hood’s house is located in the top right of your map) on a path that headed southwest all the way to her grandma’s cottage. (Pause and allow students to draw their maps)

About halfway to the cottage she met the Big Bad Wolf who asked, “Where are you going, little girl?” “To my grandma’s, Mr. Wolf!” she answered. Little Red Riding Hood continued to walk and she suddenly encountered a bridge that had a river flowing under it from the NW to the SE. On the east side of the bridge, the river flowed into a lake. (Pause and allow students to draw their maps)

The Big Bad Wolf then ran to her grandmother’s cottage, which was located in the mountains, and knocked on the door. When Grandma opened the door, he locked her up in the cupboard. The wicked wolf then wore Grandma’s clothes and layed on her bed, waiting for Little Red Riding Hood. (Pause and allow students to draw their maps)

When Little Red Riding Hood reached the cottage, she entered and went to Grandma’s bedside. “My! What big eyes you have, Grandma!” she said in surprise. “All the better to see you with, my dear!” replied the wolf. “My! What big ears you have, Grandma!” said Little Red Riding Hood. “All the better to hear you with, my dear!” said the wolf. “What big teeth you have, Grandma!” said Little Red Riding Hood. “All the better to eat you with!” growled the wolf, pouncing on her. Little Red Riding Hood screamed and the woodcutters in the forest from the west came running to the cottage. They beat the Big Bad Wolf and rescued Grandma from the cupboard. Grandma hugged Little Red Riding Hood with joy. The Big Bad Wolf ran away to the north towards the volcanoes and was never to be seen again. Little Red Riding Hood learned her lesson and never spoke to strangers ever again.” (Pause and allow students to finish their maps)

“Would anyone like to share their maps with the class and explain your map to your classmates?”

Explain 3: (15 minutes) Map Powerpoint

Open up powerpoint (slides can also be found on pages 19-23) and project onto the board.
https://docs.google.com/a/mail.gvsu.edu/presentation/d/1Xj72bCy7aZWZhBNMlVEUFdgc9cfl4RciGWMXr6WA/edit?usp=sharing

“We have been looking at different landforms, learning how to map, and now we are going to see how we can map landforms and how we can identify these land and water features on maps.”

For each of the maps ask these following questions along with the questions that are posed under the heading ‘Slide Show’.

○ How do you know that this is the water or land feature?
Is it an area of low or high land?

- **Slide Show:**
  - **Slide 2- Peninsulas**
    - “What are the circles pointing out?”
      - “Land with water on three sides”
    - “What is the name of that landform?”
      - “Peninsula”
  - **Slide 3- Major mountain ranges (blank)**
    - “What are the arrows pointing out?”
      - “Mountains”
    - “How do you know it is a mountain?”
      - “They are brown on the map and looked elevated”
  - **Slide 4- Major mountain ranges (labeled)**
    - “These are the labeled mountain ranges in the USA”
  - **Slide 5- Islands**
    - “What is the arrow pointing at?”
      - “Hawaii”
    - “And what is Hawaii an example of?”
      - “An Island”
  - **Slide 6- Volcanoes**
    - “What are all of those triangles representing?”
      - “Volcanos”
    - “What do you notice about where the volcanoes are located?”
      - “By the ocean”
  - **Slide 7- Rivers**
    - “What are all of the tiny blue lines on this map?”
      - “Rivers”
    - “What do you notice about where the rivers come from?”
      - “They originated from bigger bodies of water like oceans or lakes.”
  - **Slide 8- Lakes**
    - “What are all the blue blobs on this map?”
      - “Lakes”
    - “How do you know they are lakes and not oceans?”
      - “They are surrounded by land and are within a continent.”
  - **Slide 9- General major landforms**

**Elaborate (Apply, Extend): (20 minutes) USA Water and Landform Map**
- Pass out copies of each map (powerpoint slides, pages 10-14) that was discussed in the powerpoint and worksheet ‘USA Water and Landform Map’.
- Have them make their own maps of the United States by combining the information given in the maps. Explain to the students what a key is (a table of symbols or colors to
distinguish different land and water features) and tell them to follow the key given on the worksheet to shade where the features are located.

**Evaluate:**
- Students will be evaluated on their poster they created in the ‘explain 1’ section.
- Students will be graded on their maps they created in the ‘elaborate’ section.

‘Explain 1’ Poster Presentation Grading Criteria:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Points Possible</th>
<th>Points Received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poster contains correct information including a descriptive definition and accurate drawing.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Poster is neat and well assembled.</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Presentation was well rehearsed. Students maintained eye contact and used a loud speaking voice.</td>
<td>5</td>
<td></td>
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</table>

‘Elaborate’ USA Map Grading Criteria

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<tr>
<th>Criteria</th>
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<tbody>
<tr>
<td>Map contains all required (lake, ocean, mountain, peninsula, island, volcano, and river) aspects and is accurate.</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Map is neat and well assembled.</td>
<td>5</td>
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Scientific Background for the Teacher
Landforms are natural features that occur on earth’s surface. The most significant types of landforms are oceans and continents. The two types of landforms can be categorized into several subcategories known as valleys, hills, mountains, islands, peninsulas, lakes, rivers, plateaus, plains, and volcanoes. The formation of these landforms are due to many factors including tectonic forces, erosion, and deposition.

<table>
<thead>
<tr>
<th>Name of Land/Water Feature</th>
<th>Description of Land/Water Feature</th>
<th>Picture/Map</th>
</tr>
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</table>
| Valley                     | A low area that is located between mountains and hills.  
  • Types:  
    ○ V-Shaped: formed from erosion and rivers  
    ○ U-Shaped: formed from the movement of glaciers | ![Valley Image] |
| Mountain                   | Feature contains chunks of rock which rises significantly higher than the surrounding terrain.  
  • 5 Types:  
    ○ Fold  
    ○ Fault-Block  
    ○ Dome  
    ○ Volcanic  
    ○ Erosional  
  • Contains steep sides and a peak.  
  • Can be found on land or underwater. | ![Mountain Image] |
| Island                     | An area of land, smaller than a continent, that is completely surrounded by water.  
  • Can be surrounded by a sea, ocean, river, or lake. | ![Island Image] |
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<td><strong>Plateau</strong></td>
<td>Fairly level land on an elevated surface.</td>
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<td></td>
<td>- Usually lie between mountains or cliffs.</td>
</tr>
<tr>
<td></td>
<td>- Suitable for growing crops and livestock grazing.</td>
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<td><strong>Volcano</strong></td>
<td>Cone shaped mountain that is formed from material (lava or pyroclast) that is emitted from Earth’s crust.</td>
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<td></td>
<td>- 5 Types:</td>
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<td></td>
<td>- Shield</td>
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<td></td>
<td>- Cinder Cone</td>
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<td></td>
<td>- Composite</td>
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<td></td>
<td>- Caldera</td>
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<tr>
<td></td>
<td>- Lava Dome</td>
</tr>
<tr>
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<td>- Located above and below sea level.</td>
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References


Little Red Riding Hood Map
Little Red Riding Hood Map KEY
USA Water and Landform Map KEY

<table>
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<tr>
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<tr>
<td>River</td>
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<tr>
<td>Mountain</td>
<td></td>
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