INTRODUCTION:

When prevailing winds travel across an ocean they picking up moisture along the way. When the encounter a mountain barrier, such as the Big Island of Hawaii, the mountains help play a significant role in modifying the distribution of rainfall. On the Big Island of Hawaii, the windward side causes the prevailing winds to be pushed upward. This creates a rainy side due to the rising, expanding, cooling, and condensing air mass. The leeward side experience the exact opposite. The air sinks, condenses, and warms and creates an extremely dry side.

OBJECTIVE:

You will compare the topographic map and a precipitation map of the Big Island of Hawaii to see how mountain barriers play a role in rainfall patterns.

VOCABULARY:

Orographic Effect

Isohyet

Windward

Leeward

Rainshadow Effect

Trade Winds
PROCEDURE A: ELEVATION

1. Using the elevation data on “Map A: The Big Island of Hawaii Contour Map” construct contour lines at an interval of 500 meters.
2. Label the following volcanic mountains with their names according to their elevations:
   - Kilauea - 1,247 meters
   - Mauna Loa - 4,169 meters
   - Mauna Kea - 4,208 meters
   - Kohala - 1,678 meters
   - Hualalai - 2,515 meters

PROCEDURE A: RAINFALL PATTERNS

1. Using “Map B: The Big Island of Hawaii Rainfall” trace over and darken the 20 inch, 50 inch, 100 inch and 200 inch isohyets.
2. Using the color key below, shade the following intervals.

<table>
<thead>
<tr>
<th>Rainfall</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater than 200 inches</td>
<td>blue</td>
</tr>
<tr>
<td>100 to 200 inches</td>
<td>green</td>
</tr>
<tr>
<td>50 to 100 inches</td>
<td>brown</td>
</tr>
<tr>
<td>20 to 50 inches</td>
<td>orange</td>
</tr>
<tr>
<td>Less than 20 inches</td>
<td>yellow</td>
</tr>
</tbody>
</table>
Lab Activity: Rainfall Patterns
DISCUSSION QUESTIONS:

1. Which coastline of Hawaii has the most annual rainfall?

2. Which side of the Big Island of Hawaii has the least rainfall?

3. Describe the most likely direction of the prevailing winds across the Big Island of Hawaii?

4. Where is the rainshadow area on the Big Island of Hawaii?

5. Why is the rainfall pattern different on the Mountains of Kohala and Mauna Kea?

CONCLUSION: How do mountain barriers modify rainfall patterns on Hawaii’s Big Island?