

Materials

- Map of the World
- Sticky Notes with pictures of tropical plants, e.g. cocoa, banana, pineapple, sugarcane, coconut, mango
- Optimal Growing Temperature Chart

Preparation

- Make copies of the Optimal Growing Temperature Chart (1 per group)

PROCEDURE

Part 1: Tropical Plants of the World

- Arrange students into small groups. Pass out a sticky note with a picture on it to each pair/group.
- Have students discuss where they think their product is principally grown. Then, have students stick their product onto that location on a map of the world.
- After each group has posted its note, discuss the locations as a class. Note the centers of production for each crop (Pineapple: Brazil and SE Asia; Banana: India, Brazil, SE Asia; Cocoa: W Africa, SE Asia, Brazil; Sugarcane: Brazil, India, SE Asia; Coconut: SE Asia, India, Brazil; Mango: India, SE Asia, Mexico.)
- On the map, point out the Tropics of Cancer and Capricorn. Students make guesses as to the difference between the area between the Tropics and the areas to the North and South of the Tropics.
- “Each product on the map is considered a tropical plant. The area between the Tropics of Cancer and Capricorn get more direct sun exposure per year than the areas closer to the North and South poles. There is little seasonal change, and temperatures remain generally warm in the Tropics.”

Part 2: Temperate and Tropical Plants of the United States

- “Pennsylvania is located in a temperate region of the planet. While tropical plants cannot be grown here, many important food crops can be.”
- Introduce the optimal growing temperature chart and review how to read it.
- “The USDA Hardiness Zone map divides the United States into 11 different climate zones, from coldest (1) to warmest (11). Zones are based on a region’s average minimum temperature. Gardeners consult the Hardiness Zone map to determine what can be grown and when.”
- Select a student to find your region’s zone on the map. As a class, note the region’s average minimum temp.
- Returning to their pairs/groups, have students make a list of the fruits and vegetables they eat. Then, pass out the optimal growing temperature chart and the USDA Hardiness Map for the next activity.
- Have students make two lists on a piece of paper: “Products that can be grown here” and “Products that must be grown elsewhere”. Using their USDA Hardiness Zone maps and Optimal Growing Temperature charts, have students place food products from their “Foods I Eat” lists into their proper categories.
- Have student pairs share their lists. Discuss results as a class.

ENGAGE

“What did you eat for breakfast today?” As a class, make a sizable list of food crops on the board. For products such as “orange juice”, list the primary ingredient, “oranges”. Circle a few food items from the list that will be featured in the following activity. “Can anybody guess where some of these food crops are grown?” Record students’ guesses next to featured crops. “Can we grow items fruits such as bananas and oranges in our Edible Schoolyard? Why not?” Transition to tropical and sub-tropical plants of the world activity.

OBJECTIVES

- Students will be able to identify the tropics and temperate zones on a map
- Students will be able to identify origins of common fruits and vegetables on a map.
- Students will understand how optimal temperature requirements of select fruits and vegetables correspond with their USDA Hardiness zone(s).

EXPLAIN

Tropical Plants:

The Earth’s tropical zone is an area of the planet located near the Equator. The Tropic of Cancer, located at 23.5° N, forms its boundary in the Northern Hemisphere, while the Tropic of Capricorn, located at 23.5° S, forms its boundary in the Southern Hemisphere. Tropical weather is characterized as being consistently warm and humid year-round, with no snow, ice, or frost. Many of the world’s staple food crops, such as bananas, coffee, and sugarcane, thrive under the predictably hot and humid weather conditions found in the Earth’s tropical zones. Tropical Zones are often grouped into more specialized climate categories, such as “humid-tropic”, “arid-tropic”, or “monsoon zones”. Such labels are very helpful when discussing agricultural crops, as many crops can be successfully grown in similar climate zones around the globe.

Temperate Plants:

The Earth’s temperate zones are located between the Tropic of Cancer and the Arctic Circle in the Northern Hemisphere (North Temperate Zone) and between the Tropic of Capricorn and the Antarctic Circle in the Southern Hemisphere (South Temperate Zone). Temperate zones are defined as having distinct variations in weather throughout the year. As the USDA Hardiness Map illustrates, the United States is home to a wide range of temperate and even sub-tropical climates. In the United States, many regions have defined seasons during which only a select array of garden crops are able to grow (e.g. kale in the winter, tomatoes in the summer).

ADDITIONAL CONTENT INTEGRATION *(see previous page)*

Part 1: Have students research what causes the seasonal changes in temperatures outside the tropics. What other factors affect temperature change? (Altitude, water...) **Part 2:** In the first column, students put a star next to the products that can be grown here but that prefer warmer temperatures and require starting indoors (e.g. melons, eggplant). Have students circle the plants from both lists that can tolerate slightly colder temperatures (e.g. cauliflower, carrots, oranges, pineapple).

Additional Materials

- Pencils, markers, or crayons

EVALUATE

Journal prompt: Do you have a favorite tropical fruit? Create an illustrated plant profile that features the plant’s name, its optimal temperature range, and where it is commonly grown throughout the world.