Spinach

1. **Research the nutritional benefits of folate. What are some other food sources that contain folate?**

   Folate plays an essential role in making new body cells by helping to produce DNA and RNA, the cell's master plan for cell reproduction. It may help protect against heart disease and help lower the risk of delivering a baby with neural tube defects, such as spina bifida. Other food sources are navy beans, wheat germ, avocado, orange, bread, and peanuts, butter head lettuce and milk.

2. **How does spinach compare in protein-content with other green vegetables, like broccoli, red leaf lettuce, green beans, and avocados?**

   - Spinach, 2 cups = 2 g protein
   - Broccoli, 2 cups chopped = 4 g
   - Green beans, ½ cup boiled = 1 g
   - Romaine, 1 cup shredded = 1 g
   - Avocado, 1 medium = 3.6 g

3. **Spinach contains a chemical called oxalic acid, which binds with iron and calcium and reduces absorption. Ask student to provide ways to help improve absorption of these minerals.**

   To improve absorption, spinach should be eaten with vitamin C-rich foods such as orange juice, tomatoes and citrus fruit.

4. **Ask student to research chlorophyll and its role in the growth process of plants and vegetables.**

   Chlorophyll is a green photosynthetic pigment found in plants, algae, and cyanobacteria. The first step in photosynthesis is when incoming light is absorbed by chlorophyll which ionizes it. The resulting chemical energy is then

captured in the form of ATP, and ultimately used to convert carbon dioxide and water to carbohydrates and oxygen. Chlorophyll absorbs most in the red and blue portions of the electromagnetic spectrum, resulting in its intense green color. Chlorophyll also receives energy indirectly from accessory pigments, such as the carotenoids, which also absorb light and transform it to electropotential but whose function is to transfer that energy to chlorophyll.

5. **Determine how much of the spinach harvested in California goes into processed and frozen foods vs. how much is available to be sold whole/fresh.**

   Seventy-four percent (74%) of the spinach grown in California is used for processed foods.

6. **On a blank California map, ask students to create a color key and color in which counties grow the highest volume of spinach, second highest, etc.**

   Where spinach is grown:
   - South and Desert Valley: Imperial and Riverside counties
   - South Central Cost: Santa Barbara and Ventura counties
   - North Central Coast: Monterey, San Benito, Santa Clara, and Santa Cruz counties
   - South San Joaquin Valley: Stanislaus and Tulare counties
   - Monterey County: Almost 50% of Californian production
   - South Central Coast: 25% of California production
   - San Joaquin Valley: 25% of California production
   - Limited production in Riverside County

Sources:
http://ods.od.nih.gov/factsheets/folate.asp
www.nal.usda.gov/fnic/foodcomp/search/
www.cdfa.ca.gov

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