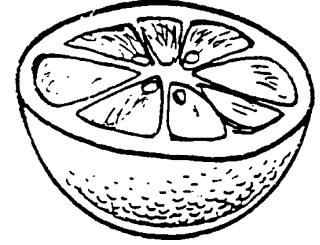


A “Sour” Subject

Name _____

Team Member Names _____



Today, we will continue our study of percentages as we compare and contrast a grapefruit to a lemon. “Compare” means to find similarities between items. “Contrast” means to find differences between two or more items.

Predictions

Complete the following sentences:

I think grapefruit and lemons are similar because _____

I think grapefruit and lemons are different because _____

Introduction

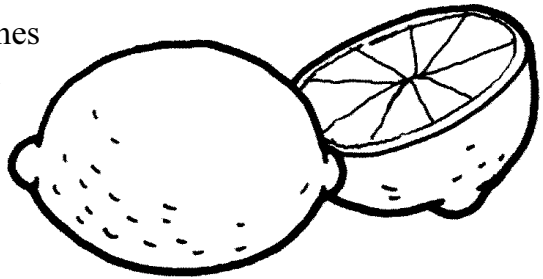
Grapefruit, lemons, oranges, and limes are citrus fruits that are grown in warm climates including California, Arizona, and Florida. Florida is the top producing citrus state. Florida and Arizona most often produce oranges that are processed into juices. Most California oranges are of the naval variety, which is a seedless fruit eaten fresh.

A “Sour” Subject

Name _____

Grapefruit, as do lemons, grow on evergreen trees whose leaves have a waxy cuticle covering. Grapefruit were given their name when people noticed that they grow in clusters—just like grapes grow in clusters. Grapefruit trees produce best when they are grown in places that have hot summers and winters that never get colder than 20°F (-6.66°C).

Lemons are a popular ingredient in many dessert dishes but are most often recognized as the main ingredient in lemonade. Ventura County is the leading producer of lemons in the United States. Because of its unique coastal location some lemon trees can produce fruit three to four times per year—this is unique to that region.



Over the past several decades (a decade is ten years), more citrus varieties have been developed and commercialized. The Pixie mandarin, a sweet small orange-colored fruit was developed by the University of California in Riverside. It is now a popular citrus fruit in the stores today.

Farmers must protect their trees from winter frost and summer “sunburn.” Perhaps you have seen some trees painted with white paint to protect the trunks from the sun. During the winter, growers must protect their trees from too much water. If this is a challenge, tree trunks are painted with a substance that is greenish-blue. This chemical prevents wet trees from getting diseases that are caused by bacteria and fungi that grow on wet citrus roots.

All citrus farmers must protect their trees from insects and other pests. The most common pest is the common garden snail. Copper rings are placed around citrus trunks. This produces a physical barrier that the snails will not cross, because if they do, they will receive an electrical shock. Garden snails are also controlled by the release of special types of carnivorous snails. These special snails eat the harmful snails and do not eat any plants. Perhaps you might be interested in researching other citrus pests, such as the “citrus bud mite.”

Lemons are usually smaller than grapefruit and generally are more sour than grapefruit. There is one exception to this, however. The “Ponderosa” lemon tree produces lemons that weigh approximately two pounds each! They have a very mild lemon flavor similar to the taste of the lemon flavor in lemonade.

A “Sour” Subject

Name _____

True or False?

_____ Grapefruit and lemons are grown on trees that stay green all year long.

_____ Lemons are *never* larger than grapefruits.

_____ Lemon and grapefruit trees can become sunburned.

_____ California farmers do not grow lemons or grapefruit.

_____ Grapefruits grow in clusters.

Procedure

1. Obtain $\frac{1}{2}$ grapefruit, $\frac{1}{2}$ lemon, and other supplies as indicated by your instructor.
2. Examine the fruit. Draw a cross section of each fruit. Make sure you illustrate the exact number of segments and any seeds you see. The more detail you can add, the better.

Grapefruit Cross Section	Lemon Cross Section

A “Sour” Subject

Name _____

3. Complete the chart below, using a balance, if necessary. Follow your teacher’s instructions on set-up and clean-up procedures.

	Grapefruit		Lemon	
	One-half Fruit	Whole Fruit*	One-half Fruit	Whole Fruit*
A. Total Mass**				
B. Mass of Peel				
C. Mass of Juice				
D. Mass of Seeds				
E. Mass of Pulp				
F. Number of Seeds				

* The whole fruit masses can be estimated by multiplying the one-half fruit answers by two.

** $B + C + D + E$ should equal A. Do you know why? Why do you suppose this may not be true with the actual data gathered?

4. Carefully observe several seeds of each fruit using a dissecting microscope or hand lens. In the space below, draw several seeds of each fruit.

Grapefruit Seeds	Lemon Seeds

A "Sour" Subject

Name _____

5. As a group, determine a procedure for finding the percentages of each part of the fruit. Describe how your group will find the percentages. _____

6. Using the procedure you described above, complete the chart below.

Percentages	Grapefruit	Lemon
% of Peel		
% of Juice		
% of Seeds		
% of Pulp		

