Fruits Are Full of It

Did you know that a watermelon, including rinds and seeds, is approximately 93 percent water?

Equipment/Materials

knife	apple
postal scales, digital scales or triple beam balance	several grapes
three glass pie plates	lemon
labels or tape	marker

Procedure

1. Cut a fresh apple into quarters and weigh each quarter.

2. Separate and label each quarter. Record the weight for each one on the data sheet.

3. Repeat these steps for the lemon and four split grapes.

4. Place each fruit on an individual pie plate, keeping the pieces separate and labeled.

5. Place the pie plates in a sunny, airy spot to allow the fruit to dry. A food dehydrator may be used if it is available. A warm oven with the door open may be used in wet, cold weather. Dehydration times will be much shorter and will require measurements at approximately 2-hour intervals.

6. Allow the fruit to dry for 12 hours.

7. Weigh each piece of fruit and record the weight on the data table.

8. Allow the fruit to dry another 12 hours, weigh it again, and record results in the data table.

9. Allow the fruit to dry for 3 more days, weigh it again, and record the results in the data table.

10. Calculate the water loss for each of the pieces in each observation period.

11. Using this information, calculate how much water would be in a whole apple, whole lemon or whole cluster of grapes.

12. Calculate the percentage of each fruit that is represented by water.

For more advanced students or to increase critical thinking skills, try slicing the sections to various thicknesses. Thinner slices will dehydrate more quickly and completely than thicker ones. Challenge the young people to determine why there are differences in the water loss rates. Note that the thinner slices have greater surface area for their volume, thus exposing more of their tissues to the drying air and providing a greater evaporative surface. Ask them to think of ways this surface-to-volume relationship might impact stored water, evaporation of surface waters or similar situations. Lead them to conclude that equal volumes of water stored in deep and shallow lakes will have very different evaporation losses if other conditions are similar. Have them try to devise an experiment to test their hypothesis, like putting equal amounts of water in a flat pan and in a graduated cylinder or tall glass and noting the loss rates over specified time periods.

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Fruit Dehydration Data Table

Fruit		Original	12 hours	24 hours	4 days	Water loss
Apple	1	_____	_____	_____	_____	_____
	2	_____	_____	_____	_____	_____
	3	_____	_____	_____	_____	_____
	4	_____	_____	_____	_____	_____
Lemon	1	_____	_____	_____	_____	_____
	2	_____	_____	_____	_____	_____
	3	_____	_____	_____	_____	_____
	4	_____	_____	_____	_____	_____
Grape	1	_____	_____	_____	_____	_____
	2	_____	_____	_____	_____	_____
	3	_____	_____	_____	_____	_____
	4	_____	_____	_____	_____	_____

Apple

Water loss in 12 hours _____   Water loss in 24 hours _____

Water loss in 4 days _____   Percent water in apple _____

Lemon

Water loss in 12 hours _____   Water loss in 24 hours _____

Water loss in 4 days _____   Percent water in lemon _____

Grape

Water loss in 12 hours _____   Water loss in 24 hours _____

Water loss in 4 days _____   Percent water in grape _____