## MCj04417800000[1]The Occurrence of Water in Living Things

**Background:**

Water is an essential part of every living thing. Plants use water in deriving some of their [nutrients](http://www.extension.umn.edu/distribution/youthdevelopment/components/0328-07.html#nutrients) from minerals in the soil. These minerals have to be dissolved in water in order to be absorbed by the plants. This is why a desert can be mineral-rich, yet support very little plant life except during brief rainy periods.

To illustrate how much of a plant is actually water, imagine burning a log in a fireplace. The ash that remains after the log is burnt contains nearly all of the nutrients. The greatest part of the log went up the chimney as smoke. This smoke consisted of water vapor and organic material manufactured by the leaves.

Not all of the water taken in by the plant remains there. Much is [transpired](http://www.extension.umn.edu/distribution/youthdevelopment/components/0328-07.html#transpired), or given off, by the leaves. At night, little water is lost, but during a hot, dry day there is much water given back to the air. In fact, this is one of the major ways in which water is returned to the atmosphere. For example, an [acre](http://www.extension.umn.edu/distribution/youthdevelopment/components/0328-07.html#acre) of corn (20,000 to 25,000 plants) gives off about 3,000 to 4,000 gallons of water each day.

Water is taken into the body by eating plants and meats and by drinking beverages. Humans can go for a month without eating but will die in 3 to 5 days without water because our bodies are made up of about 70 percent water. (That is about 15 gallons for an adult.) The body uses water in maintaining its temperature, breathing, digesting food, and lubricating moving joints.

* All living organisms consist mostly of water.
* The adult human body is about 60% water, by weight, and 75% by volume.
* As much as 95% of the weight of some plants is due to the water they contain.

**Experimental Question**: Which organic material has the greatest percentage of water: grass clippings, grapes, or carrot?

**Hypothesis**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Independent Variable:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Dependent Variable:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Control:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Constants:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Materials:**

* Balance
* Grass clippings
* Grapes
* Carrot
* Newspaper

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| **Procedure:**   1. Make sure the balance is zeroed. 2. Measure the mass of a handful of grass clippings then set them on a paper towel to dry. Record mass in the data table below. 3. Measure the mass of a grape, then cut it in half and place on paper towel to dry. Record weight in the data table below. 4. Measure the mass of a carrot then cut into strips and set out to dry. Record weight in the data table below. 5. The grass, grapes, and carrots will be left to dry until next class. 6. After drying, measure the mass of the grass, grapes, and carrots separately and record data. 7. Subtract the dried mass from the fresh mass to calculate the total water lost. 8. Calculate the percent water in each item by using the equation=   Total grams of water lost (g)  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ X 100 = Percent (%) of Water  Mass of Fresh (g) | |  | | --- | |  | |  | |  | |  | |

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| **Item** | **Mass- Fresh (g)** | **Mass- Dried (g)** | **Total water lost (g)** | **Percent (%) Water** |
| Grass clippings |  |  |  |  |
| grapes |  |  |  |  |
| carrot |  |  |  |  |

**Graphing:** Graph percent water of each item. Don’t forget to label graph, label axis, number axis, etc.

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**Analysis**

1. Which material contained the most water (highest percentage)?

2. Grass is a leaf, grapes are fruits, and a carrot is a root. Based on the data of this lab, do different parts of the plant contain more water than others? **Suggest a reason for this.**

4. What story does the graph tell?

5. What do you know about the effect of the independent variable on the dependent variable? Do you see a relationship?

**Conclusion**

Write a Conclusion. Make sure to cover the following points.

* Answer your original question. (Which organic material has the greatest percentage of water?)
* Accept or reject your hypothesis and restate your hypothesis.
* Use actual data (real numbers) to provide evidence for what you say.
* Identify any sources of errors.
* Identify any improvements that can be made.