**Analyzing van Helmont’s Willow Experiment**

Students Directions

Jean Baptista van Helmont (1577 – 1644) performed a classic experiment on photosynthesis. In the paragraph below, van Helmont describes his experiment. Read the paragraph and then address the questions that follow.

*I took an earthen pot and in it placed 200 pounds of earth which had been dried out in an oven. This I moistened with rain water and in it planted a shoot of willow which weighed five pounds. When five years had passed the tree which grew from it weighed 169 pounds and about three ounces. The earthen pot was wetted whenever it was necessary with rain or distilled water only. It was very large, and was sunk in the ground, and had a tin plated iron lid with many holes punched in it, which covered the edge of the pot to keep air-borne dust from mixing with the earth. I did not keep track of the weight of the leaves which fell in each of the four autumns. Finally, I dried out the earth in the pot once more, and found the same 200 pounds less about 2 ounces.*

Data: Write down the weights van Helmont measured:

Initial weight of soil = Initial weight of plant =

Final weight of soil = Final weight of plant =

Change in weight of soil = Change in weight of plant =

Analysis:

1. Restate in your OWN words the experiment by van Helmont. What question was van Helmont trying to answer?
2. Based on the information above, what is your conclusion from this experiment? Also write down possible questions or errors that might concern the experiment.
3. In van Helmont’s experiment, light energy was necessary for the willow to gain mass. What happened to the light energy after it reached the willow plant? Write the specific equation for photosynthesis and relate the equation to this question.
4. In the space below show, use a drawing and phrases of explanation, to demonstrate what happened during this experiment. Show in particular where the new mass in the plant came from. Also show the specific types of energy conversions. Refer back to the photosynthesis equation for hints.