Name _____ Teacher _____ Date _____

3.4GL Grading Observing Plants' Mass Changes, Part 2 Worksheet

*This worksheet has "grading" in the title because at this point, students can be held accountable for correct answers. Level 4 (correct) responses to the questions are in **blue bold italics** below. There are also comments about common Level 2 and Level 3 responses to help you with grading and making decisions about what to emphasize in future lessons.*

Red italics suggest ways to grade student responses by giving them points for correct or partially correct answers. There are 11 points total on this worksheet.
Use this worksheet to complete the Observing Plants' Mass Changes investigation and to record your observations, measurements, and class results.

A. Steps in the investigation: *Check the box as you complete each step.*

1. ☐ Gather together the following worksheets:
    a. Pre 0.2GL Plant Growth Investigation Setup and
    b. 3.4 Observing Plants Mass Changes Part 1.
2. ☐ Fill in the following data in the data table in Part C on this worksheet using data from your previous worksheets:
    a. Total solid mass in test tube before (from Pre 0.2)
    b. Total solid mass added to test tube during watering (from Pre 0.2)
    c. Wet masses in test tube after (from 3.4)
    d. Estimated dry mass of gel (from 3.4)
3. ☐ Place an empty container on the digital scale and tare the scale.
4. ☐ Mass the dried plant. Record the solid plant mass on your data table in Part C. You can compare the measured dry mass to the estimate you made in 3.4.

B. Observations during the investigation: *Record your macroscopic-scale observations below. Use drawings and/or words.*

Observations will vary from group to group, but every student should record observations from his or her group.
2 points for observations that incorporate multiple measurable variables that accurately reflect changes that occurred in the plants.

C. Measurements during the investigation: *Record your measurements in the table. If the mass is less than 0.01g, record it as <0.01g. For our purposes, we will treat this as a zero when doing any calculations with it. Average ranges of values students may obtain are shown below.*

7 points total for chart.

Inputs	***Outputs***
Total solid mass in test tube before (use number from Part B in Pre-Lesson Activity 0.2GL Plant Growth Investigation Setup Worksheet) Dry mass of radish seed: ***<0.01*** g Dry mass of gel: ***(avg. 0.2 to 0.35)*** g *1 point per measurement. 2 points total.*	**Wet masses in test tube after** Wet mass of plant: ***(avg. 0.7 to 3.0)*** g Wet mass of gel: ***(avg. 10.0 to 20.0)*** g *1 point per measurement. 2 points total.*
Total solid mass added to test tube during watering (add the total in the last column from Part C in Pre-Lesson Activity 0.2GL Plant Growth Investigation Setup Worksheet) Mass: ***(avg. 0.0 to 0.005)*** g *1 point per measurement.*	**Total solid masses in test tube after** Dry mass of plant: ***(avg. 0.05 to 0.21) g*** Dry mass of gel: ***(avg. 0.2 to 0.35) g*** *1 point per measurement. 2 points total.*

D. Results for the whole class: *Make notes about how the observations and measurements of other groups compared to yours. Describe patterns in your class data.*

1. Changes in dry mass of the plants:

All students should observe an increase in dry mass of the plant compared to when it was a radish seed.

1 point for class patterns.

2. Changes in dry mass of the gel.

All students should observe little or no change in the dry mass of the gel from the beginning to the end of the experiment.

1 point for class patterns.