**Procedure**

**I. Labeling**

1. Attain 50 clear planter cups (plastic cups) all the same size, color, etc..

2. Label cups 1A?1J, 2A?.2J, 3A?3J, 4A?.4J, 5A?.5J with a permanent sharpie marker.

**II. Preparing the Grape Seed Extract**

1. Take apart the grape seed extract capsules and pour powder content into 250ml beaker

2. Throw away gel caps

3. Pour grape seed extract into cupcake filter and mass it 41.6g

4. Take away 1.6 grams so we have an even amount-40 g

5. Measure 16g, using the tiny plastic spoon, and place in one cupcake

filter, repeat with 12g, 8g, and 4g. The 16g will represent the 100%solution, the 12 grams will represent the 75%solution, the 8g will represent the 50% solution, and the 4g will represent the 25% solution.

**III. A Test run to see how much vermiculite to use in our experiment**

1. Attain a plastic cup and add 2cm of sand (gravel) to the bottom of the cup

2. Add 6cm of vermiculite , in total, equaling 8cm of substance in the cup

3. Add 75ml of water

\*\*NOTE: Water was properly absorbed to last a period of 3 weeks, so those are the measurements of sand, vermiculite, and water we will use.

**IV. The Actual Experiment**

1. Attain 4 2000ml beakers (1000ml beakers were not available, but they would have been more convenient)

2. Measure up to 750ml of distilled water in each beaker; each concentration will have 75ml of water in each of 10 cups; 75 x 10=750ml

3. Add 16g (100%solution) to Beaker 1

4. Add 12g (75%solution) to Beaker2

5. Add 8g (50%solution) to Beaker 3

6. Add 4g (25%solution) to Beaker 4

7. Heat each beaker on a hot plate until solutions are properly mixed into distilled water, but not hot enough or long enough to change the chemical properties of the grape seed extract

8. Stir continuously

9. Wait for solutions to cool a few minutes before proceeding with experiment

10. For each cup in group 1 ( 1A?1J), our control group, with no grape seed extract and only distilled water, measure 75ml of distilled water in graduated cylinder and add to each cup

a) Place 5 radish seeds in a circle pattern on top of the cup and push finger down on seeds to insert them in vermiculite

b) Immediately take another clear plastic cup and place upside down on top of the planter cup

c) Tape around circumference of where the 2 cups join.

d) Repeat with each 10 cups of that concentration

11. For each cup in group 2 (2A?2J), our 25%solution, measure out 75ml of substance in Beaker 4

a) Repeat steps a-d

12. For each cup in group 3 (3A?3J), our 50%solution, measure 75ml of substance in Beaker 3

a) Repeat steps a-d

13. For each cup in group 4 (4A?4J), our 75%solution, measure 75ml of substance in Beaker 2

a) Repeat steps a-d

14. For each cup in group 5 (5A?.5J), our 100%solution, measure 75ml of substance in Beaker 1

a) Repeat steps a-d

15. Place half of the planter cups in 1 containers with one from each concentration facing the shorter end of the container

a) Repeat with other container

16. Watch over a three week period of time and then record data

**V. Post-Experiment**

\*\*\*NOTE: This next (post-experimental) step was not measured out precisely because it wasn?t part of our actual experiment, but was designed to decide if the concentrations of grape seed extract were too high or unreasonable for the radish seeds in the planter cup environments. If this experiment showed higher and more significant results, then we could assume a lower concentration of grape seed extract for the 100%dilution and so on would be more appropriate in this kind of experiment.

1. Attain 5 petri dishes and label with wax pencil on the bottom of them: A-control, B-100%, C-75%, D-50%, and E-25%

2. Place paper towels soaked in water in Petri dish ?A? to create a moist bedding for the radish seeds

3. Make the leftover dry grape seed extract our 100%dilution. (leftover grape seed extract plus water to fill up to 100ml)

4. Place 100ml of it in a graduated cylinder

5. Pour a certain amount of this dilution into petri dish ?B? until bedding is once again soaked

6. Add 25ml of water to dilution to create 75% solution. Pour a certain amount (as close as possible to previous amount poured) of this dilution into petri dish ?C? until bedding is once again soaked.

7. Add 50ml of water to dilution to create 50% solution and repeat step 6 but pouring into petri dish ?D?

8. Add 75ml of water to dilution to create 25%solution and repeat step 6 but pouring into petri dish ?E.?

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