

7th Grade Science Packet
Ms. Salcedo

Direction: For each of the scenarios below answer questions A-D

- A. Identify the independent variable, levels of the independent variable, dependent variable, number of repeated trials, constants, and control (if nay)**
- B. Identify the hypothesis for the experiment. If the hypothesis is not explicitly stated, write one for the scenario**
- C. Draw an experimental design diagram, which includes an appropriate title and hypothesis**
- D. State at least two ways to improve the experiment describe d in the scenario**

Scenario # 1

Richard wanted to test which brand of wax was most effective. He tested four brands of wax. He cleaned the hood of his car and removed the old wax. He measured four equal sections on the hood of the car. Each of the waxes was used to cover a section. An equal amount of wax, the same type of rag, and equal buffing were used. Five drops of water were placed on each square , and the diameter of each drop was measured (cm) (quantitative) . Richard could have used a qualitative dependent variable by developing a rating scale for the amount of shine, from dull to very shiny.

Scenario # 2

Mary read that certain perfume esters would agitate bees. Because perfume formulas are secret, she decided to determine whether the unknown ester X was present in the four perfumes by observing bees behavior. She placed a saucer containing 10 mL of the first perfume 3 m from the hive. She recorded the time required for the bees to emerged and made observations on their behavior. After a 30-min. recovery period, she tested the second, third, fourth perfumes. All experiments were conducted on the same day when the weather conditions were similar; that is air, temperature and wind.

Scenario # 3

After learning about recycling, members of John's biology class investigated the effect of various recycled products on plant growth. John's lab group compared the effect of different –aged grass compost on bean plants. Because decomposition is necessary for release of nutrients, the group hypothesized that older grass compost would produce taller plants. Three flats of bean plants (25 plants/flat) were grown for 5 days. The plants were then fertilized as follows: (a) Flat A: 450 g of 3-month old compost. The plants received the same amount of sunlight and water each day. At the end of 30 days the group recorder the height of the plants.

Scenario # 4

Elaha observed that different kinds and amounts of fossils were present in a cliff behind her house. She wondered if changes in fossils content occurred from the top to the bottom of the bank. She marked the bank at five positions 5, 10, 15, 20, and 25 from the surface. She removed 1 bucket of soil from each of the positions and determined the kind and number of fossils in each sample.

Scenario # 5

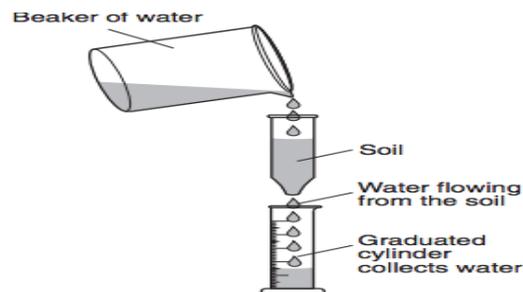
Ten seeds were planted in each of 5 pots found around the house that contained 500 g of Pete's Potting Soil." The pots were given the following amounts of distilled water each day for 40 days: Pot 1, 50 mL; Pot 2, 100 mL; Pot 3, 150 mL; Pot 4, 250 mL; Pot 5, 200 mL. Because Pot 3 received the recommended amount of water, it was used as a control. The height of each plant was measured at the end of the experiment.

Part 2: Using your science skills, create a graph and analyze the data.

1.

The Effect of Different Average Size Soil particles on the Water Retention (mL) of the Soil															
Silt Loam (medium grain size)								Sandy Loam (large grain size)							
35	36	37	36	43	39	39	42	32	34	38	37	32	36	37	30
40	37	39	39	39	42	39	42	30	34	38	40	28	31	30	29
36	36	37	40	41	40	39	41	38	36	36	36	34	36	36	31
40	38	41	37	41	41	37	41	31	35	39	31	37	37	32	35

2. We are doing an experiment to determine if the size of soil particles affects the amount of water that flows through soil. We poured 100 milliliters (mL) of water through four different types of soil. The equipment is shown below



We got the following results: With gray soil, the average particle size was 2.0 millimeters (mm) and 80 mL of water flowed through. We then used tan soil. Its average particle size was 0.5 mm and 40 mL of water flowed through. With brown soil, 60 mL of water flowed through. Brown soil has an average particle size of 1.5 mm. In our last trial we used black soil. It has an average particle size of 1.0 mm and 50 mL of water flowed through.

Using the data table below, organize the results to show the average particle size and the amount of water that flowed through for each type of soil. Be sure to include column headings, data, and units in the table.

Data Table

Soil Color		
gray		
brown		
black		
tan		