Name_____
Date_____

Experimental Designs

The following experimental designs may be incorrect. Determine the problem and write how you would fix it or determine the design to be correct.

Experiment 1

Problem: A new disease Bug-Oh is causing many people to be sick for weeks.
Hypothesis: If people take the newest medicines they will get well.
Design: Using a population of 100 people who have recently come down with Bug-Oh, (all factors have been controlled) split the population into 3 groups.
Group 1: Give one tablet to Bug-B-Gone daily.
Group 2: Give one tablet of Bug-Off daily.
Group 3: Give half tablet of Bug-B-Gone and half tablet of Bug-Off daily.
See who gets well first. That is the medicine that works best.
Design changes: _____

Experiment 2

Problem: Which mirror is best for side view mirrors?
Hypothesis: Light reflects and refracts so drivers can see behind them.
Design: Install convex mirrors on 33 Porsches, concave mirrors on 33 pick-up trucks, and flat mirrors on 33 Cadillacs. Using 33 drivers in each group, have the drivers drive the same route at the same time each day for a year.
If the Porsches have fewer accidents, then convex mirrors are best for side-view mirrors.
Design changes: _____

Experiment 3

Problem: Bacteria need nutrients to grow.
Hypothesis: Bacteria will grow better on nutrient agar.
Design: Divide the bacteria into two groups of culture dishes.
Group 1: Place the bacteria on nutrient agar and at 35˚C.
Group 2: Place the bacteria on agar/agar (no nutrients) at 25˚C.
If the bacteria on nutrient agar grow better then the hypothesis is supported.
Design changes: _____

Experiment 4

Problem: Flowers wilt when cut.
Hypothesis: If the flowers are refrigerated they will stay looking "fresh" longer.
Design: Cut 200 roses; place the stem in water. Divide the roses into two groups.
Group 1: Place the roses in the refrigerator.
Group 2: Place the roses on a sunlit counter.
If the refrigerated roses look "fresher" longer the hypothesis is correct.
Design changes: _____

Experiment 5

Problem: Many students fail tests.
Hypothesis: Studying each night for 15 minutes will improve test scores.

Design: Use a population of Biology students at Middletown High School (about 150 students), divide the population into 2 groups.
Group 1: Study Biology 15 minutes each night.
Group 2: Study only the night before each test.
If group 1 does better on the test, the hypothesis is supported.
Design changes: _____