Name _____ Period _____ Date _____

Scientific Inquiry

Read each of the following statements. If it is a testable hypothesis, write *yes*. If it is not a testable hypothesis, write no.

_____ 1. If a person exercises, his or her pulse rate will increase.

_____ 2. Cats make better pets than dogs.

_____ 3. When fertilizer is added to soil, plants grow taller.

Identify each of the two italicized items as either an independent or a dependent variable.

4. The *number of red blood cells* in a mouse's blood at *different levels of iron* in its diet

   a) independent variable - _____

   b) dependent variable - _____

5. The *amount of starch formed* in a plant leaf for *different times* of exposure to light

   a) independent variable - _____

   b) dependent variable - _____

Independent and Dependent Variables

An **independent variable** is a factor that is manipulated in an experiment. The experimenter controls whether or not subjects are exposed to the independent variable. The **dependent variable** is measured to determine if the manipulation of the independent variable had any effect. For example, to test a hypothesis that eating carrots improves vision, the experimenter would manipulate whether or not subjects ate carrots. Thus, eating carrots is the independent variable. Each subject's vision would be tested to see if carrot eating had any effect. Thus, vision is the dependent variable. The subjects assigned to eat carrots are in the **experimental group**, whereas subjects not eating carrots are in the **control group**.

Identify the independent variable, dependent variable, experimental and control groups in the following studies.

1. A group of college students were given a short course in speed-reading. The instructor was curious if a monetary incentive would influence performance on a reading test taken at the end of the course. Half the students were offered $5 for obtaining a certain level of performance on the test, the other half were not offered money.

Independent variable: _____

Dependent variable: _____

Experimental group: _____

Control group: _____

2. A social psychologist thinks that people are more likely to conform to a large crowd than to a single person. To test this hypothesis, the social psychologist had either one person or five persons stand on a busy walking path on campus and look up. The psychologist stood nearby and counted the number of people passing by who also looked up.

Independent variable: _____

Dependent variable: _____

Experimental group: _____

Control group: _____

3. To test a new voice feature in a cockpit design a flight simulator was used. The simulator was programmed to give visual readings of flight information, or to give visual and auditory (voice) readings of flight information. All test pilots were put through a simulated emergency landing procedure, but were randomly assigned to the visual, or visual and auditory conditions. Flight experts rated each pilot's performance in the simulator on a scale of 1 (very poor) to 10 (excellent).

Independent variable: _____

Dependent variable: _____

Experimental group: _____

Control group: _____