

Designing Experiments: Answers

Matching: E; D; A; C; B

Problem Solving:

- The part of each of the answers that is in brackets may vary.*

 - “As the temperature of the reactants in a chemical reaction increases, the rate of the reaction (also increases).”
 - “As the pH of the environment decreases, the population of a specific species of fish (decreases).”
 - “As the resistance of a circuit increases, the current through the circuit (decreases).”
- independent: the temperature of the reactants
dependent: the time it takes for the reaction to occur
 - independent: the pH of the environment
dependent: the population of a specific species of fish
 - independent: the resistance of the circuit
dependent: the current through the circuit
- Answers may vary: the responses below are examples only.*

 - the volume of the reactants, the concentration or surface area of the reactants, and the container in which the reaction occurs
 - the temperature of the environment, the amount of dissolved oxygen in the environment, the type of food available for the fish
 - the voltage supplied to the circuit, the configuration of the circuit, and the temperature of the resistors



- The pH of store-bought vinegar is (less than 7 since vinegar contains acetic acid).
 - at least 5 separate trials to average out the effects of randomly distributed experimental uncertainties/errors

Note that it will often be possible, rather than repeating an experiment several times yourself, to take a class set of data.