MN State Science Olympiad

Experimental Design

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Most people take water for granted, however all life depends on it. Water is a major component of the earth's surface and without it, life as we know it could not exist. Compared with compounds of similar size and organization, water has many unique properties.

TASK: Design an experiment relating to a property of water.

Some examples include: ionization/pH, solvent properties, influence of solutes, temperature effects, fluidity… or anything else you can think of. (Hint: the above are example topic areas, NOT statements of problem!!!!)

If you are uncertain whether your experiment relates to the task, just ask.

Possible Materials:

At Desk

- Masking Tape
- Sugar
- 3 Styrofoam Cups
- Plastic Box
- Graduated Culture Tube
- Thermometer
- (pH 6-8)
- 3 Straws
- Parafilm
- Scissors

At distribution center

- Graduated Cylinders
- RT Water
- Ice
- Hot Water
- Salt
- Flour
- Tris
- Bromylthiol Blue pH indicator
- 200mM HCl (Max 20 ml)
- 200mM NaOH (Max 20 ml)

Your report should include all of the following parts (clearly labeled!!!) (Hint: pay attention to point values!)

- Statement of Problem (4 pts)
- Hypothesis (4pts)
- Variables (10 pts)
  - Independent, Dependent, Controlle
- Standard of Comparison (3 pts)
- Materials and Procedures (8 pts)
- Qualitative Observations (4 pts)
- Quantitative Results
  - Data Table (6 pts)
  - Graph (6 pts)
  - Statistics (4 pts)
- Analysis and Interpretations of Results (10 pts)
- Possible Experimental Errors (3 pts)
- Conclusion (4 pts)
- Recommendations for further experimentation/Practical Applications (4 pts)

Questions or Comments about this test?

See www.experimentwisconsin.com

or send email to

experimentwisconsin@yahoo.com

Clean up: Be sure to wash all test tubes and plastic boxes. Graduated cylinders should be washed immediately after use to others can use them. Leave the masking tape, scissors, clean plastic box, and thermometer on your desk. Return all other reusable items to the distribution center.