

IEA - Data Enhancement Project

Questionnaire printing

Study: SC2

Population: 2

Instrument: STPR\_2

Student Science Test Lab Exercises (set 9A&B) Population 2

=====

Experiment I

The diagram below represents an electric tester.

[ Picture ]

Use the materials given to make an electric tester.

- 1 What happens when the wires X and Y are connected?  
(Circle one.)
  - A The bulb lights.
  - B The bulb does not light.

Use the tester to check if an electric current flows between all the various pairs of terminals (A to F) on the circuit board.

- 2 Perform the tests and record the results in the table below. Use a plus (+) to indicate that a current flows and a zero (0) if no current flows. For example, if the bulb lights when wire X touches B and wire Y touches C, a (+) should be marked under C on line B. If the bulb does not light when B and C and connected, contact the test administrator.

|   | B | C | D | E | F |
|---|---|---|---|---|---|
| A |   |   |   |   |   |
| B |   |   |   |   |   |
| C |   |   |   |   |   |
| D |   |   |   |   |   |
| E |   |   |   |   |   |

- 3 On the basis of the above experiment, which two of the following are possible ways the terminals are connected? (Circle two.)

[ 6 Pictures of possible ways the terminals are connected ]

-----  
 PR2A101    PR2A102    PR2A103    PR2A101    PR2A102    PR2A103    PR2A101    PR2A102  
 PR2A103  
 -----

Experiment II

Phenolphthalein is a colorless indicator. When a few drops are added to a basic solution, the solution will turn pink.

Blue litmus paper turns red (pink) when dipped in an acidic solution.

Before you are three vials, labelled A, B, and C. One contains a basic solution, another an acidic solution, and a third, water. Use the colorless indicator and blue litmus paper to determine the contents of each vial.

Begin by following the instructions below.

- 1 Using the information above, what will you do to determine what kind of solution is in each vial? Write down your plan.

---

---

---

---

---

CARRY OUT YOUR PLAN.

- 2 Record your observations in the chart below:

OBSERVATIONS

| Sample | Blue Litmus Paper | Phenolphthalein |
|--------|-------------------|-----------------|
| A      |                   |                 |
| B      |                   |                 |
| C      |                   |                 |

- 3 On the basis of the information in the chart above, answer the following questions:

A Which sample contains an acidic solution? \_\_\_\_\_  
What are your reasons for this conclusion? \_\_\_\_\_

---

---

B Which sample contains a basic solution? \_\_\_\_\_  
What are your reasons for this conclusion? \_\_\_\_\_

---

---

---

PR2A201 PR2A202 PR2A203 PR2A204 PR2A205 PR2A201 PR2A202 PR2A203  
PR2A204 PR2A205 PR2A201 PR2A202 PR2A203 PR2A204 PR2A205 PR2A201  
PR2A202 PR2A203 PR2A204 PR2A205 PR2A201 PR2A202 PR2A203 PR2A204  
PR2A205

---

Experiment III

It is suggested that starch could be added to a coffee creamer to make it appear thicker. One or more of the samples of creamer on the table contain starch.

Iodine solution is used to test for the presence of starch. Starch will turn blue-black in the presence of iodine.

- 1 Using the iodine solution, how would you find out which sample or samples contain starch? Outline your plan.

---

---

---

---

---

---

CARRY OUT YOUR PLAN.

- 2 Record your observations.

Sample A \_\_\_\_\_  
Sample B \_\_\_\_\_  
Sample C \_\_\_\_\_

- 3 What are your conclusions? What are the reasons for these conclusions?

Sample A \_\_\_\_\_  
Sample B \_\_\_\_\_  
Sample C \_\_\_\_\_

-----  
PR2A301 PR2A302 PR2A303 PR2A301 PR2A302 PR2A303 PR2A301 PR2A302  
PR2A303  
-----

Experiment I

Use the equipment before you to find the mass of the sinker. Then find the volume of the sinker. Now calculate the density of the sinker. Show all calculations and give the units you used to measure the mass and volume. Also give the units for density.

1 What is the mass of the sinker?

---

---

2 What is the volume of the sinker? \_\_\_\_\_ Describe the procedure you used to find the volume of the sinker.

---

---

---

---

---

3 What is the density of the sinker? ( density =  $\frac{\text{mass}}{\text{volume}}$  )

---

---

---

---

-----  
PR2B101 PR2B102 PR2B103 PR2B101 PR2B102 PR2B103 PR2B101 PR2B102  
PR2B103  
-----

Experiment II

[ Picture ]

Before you are a small cup of water and a piece of cut filter paper.

Bend the tabs with colored dots upward as shown in the diagram.

Next, turn the paper upside-down and place the four tabs into the small cup. (Be sure the colored dots are above the water surface.) DO NOT LIFT THE CUP.

- 1 By carefully turning the cup around on the table, determine if the coloring from each of the dots moves at the same rate. According to what you observe, circle the correct response below:

SAME RATE

DIFFERENT RATE

When the first color reaches the top of the paper, remove the paper and flatten it out on the table.

- 2 Describe what happened to the color of each dot.

Black dot \_\_\_\_\_  
 \_\_\_\_\_  
 Red dot \_\_\_\_\_  
 \_\_\_\_\_  
 Purple dot \_\_\_\_\_  
 \_\_\_\_\_  
 Green dot \_\_\_\_\_  
 \_\_\_\_\_

Give an explanation for what happened to the black dot.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

-----  
 PR2B201 PR2B202 PR2B203 PR2B204 PR2B205 PR2B201 PR2B202 PR2B203  
 PR2B204 PR2B205 PR2B201 PR2B202 PR2B203 PR2B204 PR2B205 PR2B201  
 PR2B202 PR2B203 PR2B204 PR2B205 PR2B201 PR2B202 PR2B203 PR2B204  
 PR2B205  
 -----

Experiment III

Test-tape is an indicator that turns from yellow to green in the presence of a certain type of sugar.

Iodine is used as an indicator to test for starch. It will turn a starch solution blue-black in color.

Before you are three cups labelled A, B, and C. One contains a sugar solution, another a starch solution, and a third contains neither starch nor sugar.

You are to determine the contents of each cup.

- 1 Using the information above, what will you do to determine which cup contains starch and which contains sugar? Write out your plan.

---

---

---

---

CARRY OUT THE EXPERIMENT.

- 2 Record your observations in the chart below.

OBSERVATIONS

| Cup | Test Tape | Iodine Solution |
|-----|-----------|-----------------|
| A   |           |                 |
| B   |           |                 |
| C   |           |                 |

- 3 On the basis of the information in the chart above, answer the following questions.

A Which sample contains sugar? \_\_\_\_\_  
What are your reasons for this conclusion? \_\_\_\_\_  
\_\_\_\_\_

B Which sample contains starch? \_\_\_\_\_  
What are your reasons for this conclusion? \_\_\_\_\_  
\_\_\_\_\_

---

PR2B301 PR2B302 PR2B303 PR2B304 PR2B305 PR2B301 PR2B302 PR2B303  
PR2B304 PR2B305 PR2B301 PR2B302 PR2B303 PR2B304 PR2B305 PR2B301  
PR2B302 PR2B303 PR2B304 PR2B305 PR2B301 PR2B302 PR2B303 PR2B304  
PR2B305

---