

MYSTERY LIQUIDS

Description:

Six common clear liquids (water, alcohol, salt solution, vinegar, mineral oil, and diluted chlorine bleach solution) will be investigated for their properties. **Safety Notes:** Wear approved splash-proof safety goggles at all times while conducting this experiment. None of the liquids are hazardous. But be **very careful** with the bleach solution!

Number of Participants: **3**

Approximate Time: 50 minutes

The Competition:

1. Provide students with numbered cups that contain the various liquids.
2. Children may use their notes to help them identify the liquids.

Materials:

salt solution (3 teaspoons of salt dissolved in 1 L water)
diluted bleach solution (1/2 L water to 1/2 L bleach)
mineral oil
bottle of vinegar
7 - 5 cm squares of black construction paper
indelible ink marking pen
Eyedroppers or disposable pipettes

water
alcohol
ice cubes
clear plastic cups
plastic spoon
baking soda

- Students should be warned never to taste anything in the science lab. Also, instruct students in the proper method of smelling an unknown: holding the container at least 6 inches away from your nose, use your hand to waft the fragrance to your nose - do not smell the liquid directly as it may be very potent and cause you to inhale a concentrated amount or to sneeze!
- **Hints:** The critical observations are: salt will remain in the dish as the water evaporates; alcohol will dissolve indelible ink; diluted chlorine bleach will bleach the black construction paper; vinegar will react with baking soda to form bubbles; ice cube will sink in mineral oil and in alcohol; and the ice cube will float in water and in salt solution.
- When students can tell each liquid apart based on properties, give each group a mystery liquid. The liquid is not a mixture, it is only one liquid. You may add to the difficulty by adding more liquids to the original six or by giving each group two mystery liquids (the two mystery liquids may be the same one!).
- When students have developed a scheme (i.e., can tell each liquid apart based upon their properties), then you may give them a mystery liquid! The liquid is never a mixture.

Scoring:

Students score 10 points for an effective scheme or written plan to solve the problem and one point for each liquid correctly identified. High score wins, break ties with time.