

# CEMPAZUCHITL, a puzzle celebrating the Mexican Day of the Dead

Carlos Mauricio Castro Acuña <castroacuna02@yahoo.com>  
Facultad de Química, UNAM, Mexico City MX

Although Halloween is celebrated in a few areas in Mexico, the traditional festivity is the Day of the Dead, which falls on November 2. Many families visit the tombs of relatives and place thousands of yellow-orange flowers named "CEMPAZUCHITL" along with other items on an offering table, called "ofrenda". The ofrenda has offerings or gifts, that typically includes candies, sugar skulls with names on the forehead, beverages and whatever item that was preferred by the dead relative. To remember their loved ones, many Mexicans create their own ofrendas in their homes.

To celebrate the Day of the Dead, Carlos invites 11 chemistry students, 6 girls and 5 boys from different countries around the world to Mexico. Carlos plans to make an ofrenda to honor loved ones, especially those who studied chemistry. All the visiting students will contribute one unique "gift" to place on the ofrenda. As well, each student will add a piece of paper with the name of his or her favorite chemical element, its symbol and some information about its properties.

In this puzzle, you will use the provided information to find out the names of the 11 guests, their country of origin, their gift and



favorite chemical element. As a strategy, you might want to begin by first identifying all the names, elements, locations and gifts. Then create a table to help sort out who brought which gift and element as well as where the student originated.

The host, Carlos, plans to contribute eggs and a ring made with his favorite element, a precious transitional metallic element with a density of  $21.45 \text{ g/cm}^3$ .

## Data

1. Curiously, if you take the first letter of the names of the 11 students and their host, you will form the word "CEMPAZUCHITL". The same condition applies for the first letter of the twelve countries, as well as for the 12 gifts and the names of the twelve favorite chemical elements present on the ofrenda. All gifts were edible.
2. Even more surprising, the first letter is not repeated in the combination of each person and their country, gift and element. For example, **C**aroline may not come from **C**osta Rica, **L**ew may not be associated with lithium, nor can **H**elen come from **H**ungary. These examples are taken directly from this puzzle's solution.
3. Maurice took a flight from Lusaka and arrived in Rome, where he met up with Emma. They had researched einsteinium and manganese. Later these students met Alexander who was carrying a small sample of milk produced in Nebraska.
4. The Canadian student brought an element discovered in 1791 by William Gregor, a British mineralogist. This student liked Thomas's chocolate, which was bought in Quito.
5. Paula arrived from Central America with a sample of tapioca, wrapped in a commonly used metallic foil made with the element selected by the girl who brought candies from Poland.
6. Zoe was born in Thailand; she placed a sample of umeboshi on the ofrenda and some information about an alkali metal. Another girl who chose a halogen, placed a piece of Australian ham on the table.
7. Two female students selected two elements that if you multiply their atomic numbers, your answer will equal 10304.
8. Ulysses brought apples from Lithuania and selected an element well known from ancient times. He asked Isabella, from Hungary, to share some of her peanuts.
9. A boy placed a paper describing calcium next to a zucchini and some African lemons.
10. Noble gas data were contributed by a boy from South America and ice cream was brought by another boy.. ■