

# An Elemental Challenge



## Introduction

Recognizing the elements and their symbols is an important part of the chemistry curriculum. Make this tedious task a little more enjoyable by challenging your students to complete the Elemental Challenge puzzle. Simple (and not so simple) clues will help students identify the symbols and names of 40 different elements.

## Tips

- The elements are arranged in order of their first ionization energies, which is similar to the order of their electronegativity values as well. First ionization energies were chosen because more elements have published ionization energies than electronegativity values. Some elements (e.g., the man-made elements) do not have published ionization energies and these values were estimated. Like most values, the first ionization energies are constantly being updated so if your periodic table has slightly different values, please don't fret.
- Give students extra credit if they can identify the physical property of the elements by which they are arranged. Have the students focus on the elements at the top of the list and bottom of the list (ignore the last two, they are estimates) and they should see a trend. Many periodic properties follow a similar trend to first ionization energies so there may be several correct answers.
- Explain to students that this activity was developed by a 45-year-old male chemist. If students need help, have them ask their parents!
- If this activity is too difficult, provide the list of element symbols, names, or atomic numbers as additional clues. The objective of the activity is to gain familiarity with the periodic table and some of the element symbols and names. Three sets of clues are included if you wish to use them.

## Possible Clues

### Element Symbols

Am, As, Ba, Be, Bi, Br, C, F, Fe, Fr, H, He, Ho, I, In, K, La, Li, Mo, Mt, N, Ne, No, Np, O, P, Pa, Pm, Po, Pu, Ra, Rn, S, Si, Tb, Ti, U, V, W, Y

### Element Names

Americium, Arsenic, Barium, Beryllium, Bismuth, Bromine, Carbon, Fluorine, Francium, Helium, Holmium, Hydrogen, Indium, Iodine, Iron, Lanthanum, Lithium, Meitnerium, Molybdenum, Neon, Neptunium, Nitrogen, Nobelium, Oxygen, Phosphorus, Plutonium, Polonium, Potassium, Promethium, Protactinium, Radium, Radon, Silicon, Sulfur, Terbium, Titanium, Tungsten, Uranium, Vanadium, Yttrium

### Atomic Number

1, 2, 3, 4, 6, 7, 8, 9, 10, 14, 15, 16, 19, 22, 23, 26, 33, 35, 39, 42, 49, 53, 56, 57, 61, 65, 67, 74, 83, 84, 86, 87, 88, 91, 92, 93, 94, 95, 102, 109

## Connecting to the National Standards

This laboratory activity relates to the following National Science Education Standards (1996):

### *Unifying Concepts and Processes: Grades K–12*

Systems, order, and organization  
Evidence, models, and explanation

### *Content Standards: Grades 5–8*

Content Standard A: Science as Inquiry

### *Content Standards: Grades 9–12*

Content Standard A: Science as Inquiry

## Answer Sheet

Clue	Additional Clue	Element Symbol	Element Name
Masculine pronoun		He	Helium
Sound a horse makes		Ne	Neon
35th President's middle initial	Kennedy	F	Fluorine
Fish '_ Chips	Short for and	N	Nitrogen
Oprah's magazine		O	Oxygen
Enthalpy		H	Hydrogen
Response to a very cold day		Br	Bromine
Average grade		C	Carbon
A nurse	Registered nurse	Rn	Radon
Pressure		P	Phosphorus
Me, myself, and _		I	Iodine
Entropy		S	Sulfur
__ <i>The World Turns</i>	A soap opera	As	Arsenic
Hamlet: To __ or not to __		Be	Beryllium
Deli sandwich: __-Boy		Po	Polonium
Spanish for "yes"		Si	Silicon
43rd President's middle initial	George Bush	W	Tungsten
Jack's giant yelled this	Jack in the Beanstalk	Fe	Iron
Good __, see you later...		Bi	Bismuth
Cow's favorite response		Mo	Molybdenum
When you don't win or lose		Ti	Titanium
Volume		V	Vanadium
A toddler's common question	Why?	Y	Yttrium
Hershey, __	Pennsylvania	Pa	Protactinium
Not me, it must be __	You	U	Uranium
One of Santa's favorite words	Ho, Ho, Ho	Ho	Holmium
Before noon	A.M.	Am	Americium
IM speak for <i>No Problem</i>	Instant Messaging	Np	Neptunium
A serious lung disease	Tuberculosis	Tb	Terbium
Father's response to a stinky diaper		Pu	Plutonium
Opposite of out		In	Indium
Cajun Country	Louisiana	La	Lanthanum
Afternoon	P.M.	Pm	Promethium
Let sleeping dogs __		Li	Lithium
Cheering on the home team		Ra	Radium
Sound a sheep makes		Ba	Barium
Strike out in baseball		K	Potassium
France		Fr	Francium
A toddler's common response		No	Nobelium
e.g., Everest	Mountain	Mt	Meitnerium

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