

# Periodic Trends Activity:

## Pernell Williams

### Teacher's Guide

#### Goals

- To learn to organize and classify the elements
- To build the periodic table of the elements from scratch

#### The Activity

In this activity, students use "Element Cards" in order to learn about the periodicity of the elements. Each card represents an element, with many of its properties listed, and the students organize several of the properties into graphs vs. the atomic mass of the elements. The students get a chance to acquaint themselves with periodic trends from first-hand experience.

#### Materials for Each Group

JUMP start—An orientation tool: Write the main topics of class on board; let students put it on paper.

Element Cards—cards which include data about elements 1-30.

See the Web site:

<http://www.dgs.oxon.sch.uk/depts/science/elements/data.htm>.

#### SAFETY

No special safety considerations are required.

#### Lecture Notes

Start off with reading the JUMP start. Make sure you know what the activity is all about.

What sort of information does the periodic table contain?

Why do we use MP, BP, atomic mass, and density? Because they show clear trends and the information is available on the Web.

Divide into groups of five. You will be assigned a task according to your age: i.e. if you're the youngest, you will list the elements by density. The fifth student will be the "boss" who graphs all the data and keeps time throughout the activity.

Spread the cards out on the table, write down the properties about whatever cards you find, then put them in numerical order.

#### Teaching Tips From Mr. Williams

I describe the periodic table as not absolutely necessary, but that's what links the children to future knowledge in chemistry. Without it they'll be lost in college.

Instead of just throwing columns at the children, you give them a chance to think about some qualities. When you move into qualities of compounds they make the connection.

It lets you introduce concepts like *mass* and *density*.

#### Example of an "Element Card"

Name: Copper
Symbol: Cu
Atomic Number: 29
Atomic Mass: 63.546 amu
Melting Point: 1083.0°C
Boiling Point: 2567.0°C
Number of Protons/Electrons: 29
Number of Neutrons: 35
Classification: Transition Metal
Crystal Structure: Cubic
Density at 298K: 8.96gm/cm <sup>3</sup>
Color: Red/Orange

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### References: Links

<http://chemlab.pc.maricopa.edu/periodic/periodic.html>

A searchable periodic table. Clicking on an element produces a list of its properties, which may be used in making the element cards in this activity.

<http://www.genesismission.org/educate/scimodule/cosmic/ptable.html>

Model your own periodic table in this activity from NASA's Genesis Project. Requires Flash plug-in. Teacher's guide included.

<http://www.uky.edu/Projects/Chemcomics/>

For comic book fans, a whimsical look at elements in the comics.

### References: Readings

Laing, M. (2001) "Melting Point, Density, and Reactivity of Metals," *Journal of Chemical Education*, Vol. 78, No. 8, pp: 1054-1058.

Jerrold J. Jacobsen, Gordon Bain, Kara Bruce, and John W. Moore. (2000) "Chemistry Comes Alive!," Volume 4: *Abstract of Special Issue 25* on CD.