

Periodic Table Hopscotch Laboratory:

Dr. Leslie Pierce

Teacher's Guide

Goals

- To visualize the concept of the mole
- To gain experience in calculating grams and moles

The Activity

In this activity, students visualize the concept of the mole using a mole of chalk as a model. They practice calculations of moles and grams, and end up with a better understanding of what a mole is and how chemists use it.

Materials for Each Group

- Data book and pencil
- Semi-analytical balance
- Students' Guide
- A chunk of chalk
- Electronic balance, if available
- A table of atomic masses
- A calculator

SAFETY

No special safety considerations are required.

Lecture Notes

Get the masses before going outside and record in your databook.

Read the directions and follow them.

The main question you're dealing with is how much chalk you leave out there, in grams or in moles.

Teaching Tips From Dr. Pierce

The activity gives the students something visual, coupled with the symbolic representation of the equation. Then they try to model the concept.

The lab is engaging and fun.

The students have to figure out what the molar mass of CaCO_3 is and they have to deduce how to do this, relative to the separate atoms from which it is made.

One can keep up with what the students are thinking much better on the worksheet.

Because chemistry is so abstract, if we can show the students different representations of the same idea, it helps them learn it.

References: Links

<http://www.chemistrycoach.com/tutorials-2.htm>

Click on "The Mole" to see a page of links to tutorials.

<http://www.gcsechemistry.com/ximoles.htm>

Explains what a mole is in chemistry and shows how to convert masses to moles. Other stoichiometric calculations are also shown.

References: Readings

Wakeley, D.M. (2000) "Developing an Intuitive Approach to Moles," *Journal of Chemical Education*, Vol. 77, No. 8, pp: 1007-1010.