

Program Activity

Gallery: Weinman Mineral Gallery

Course Name: Periodic Table – *Organizing Clutter: The Organizing of the Elements of the*

Universe [Adapted from *The Periodic Table: What's the Trend?*
Developed by S. Gould, C. Skibo, H. Kang, Kim and Jennifer and
available online at <http://www.nslc.ucla.edu/STEP/GK12/lessons.htm#Grade 8>

Grade Level: 8th -12th

Activity: Pre-field trip

Approximate Time Required: 2-3 class periods

Vocabulary:

Atom, atomic structure, Bohr model, nucleus, protons, electrons, neutrons, atomic number, atomic mass, groups/families, periods

Objective:

Students will build their own periodic table based on organizational principles that make sense to them. They will conclude by organizing a traditional periodic table and examining patterns among the elements' characteristics. Students will understand that the periodic table is organized and that elements in the periodic table are organized by atomic number.

Materials Needed:

White paper plates
3 sizes of label dots to represent protons, neutrons and electrons
3 different colored markers
Butcher paper
Masking tape
Element cards containing element name, symbol, atomic number, atomic mass, and family [\[link\]](#)
Worksheet #1

Procedure:

First Class Session:

1. Introduction: Discuss what organization means. Have your students think of their closets at home and have them write down several ways to organize all of their possessions. Ask several students to share their organizational strategies. Note that there are always different ways to organize the same things. Transition to the class by stating the same observation applies to science; there are different ways to organize data. [5 minutes]
2. Review Bohr's atomic structure model [5 minutes]

3. Hand out materials – one paper plate, different sizes of label dots, and an element card for each student (you may work with the first 30 elements or use all known elements and have students make more than one model if necessary) Also distribute the Student Worksheet [\[link\]](#)
4. Instruct students to work in pairs with each student building the atomic structure of his or her atom with the assistance of his or her partner. Go over the materials with them indicating which of the three label dots represents protons, electrons, and neutrons. Review the element card structure and tell them that they are going to use Bohr's atomic structure model to build their atoms using the materials provided. [10 minutes]
5. Tape a piece of butcher paper to the board. If you teach several classes, identify each piece of butcher paper as belonging to the specific period/class.
6. Have the students tape their plate atomic models to the butcher paper in no particular order so that students can see all the plate models.
7. The next step involves the students organizing the plate models into a periodic table that makes sense to them. Guide them along by asking the following questions:
 - a. Can we use this periodic table of elements made up of the plate atomic models?
 - b. Get students to brainstorm in small groups to come up with organizational ideas for these atomic models.
 - c. Have groups report their ideas and then let the students decide which idea to use for their class periodic table.
 - d. Have the students to the butcher paper and replace their plate models using the organizational scheme decided upon as a class.

Second-Third Class Session:

1. Review the class periodic table that was built during the last class period. Ask students to describe what they see and why the atomic plate models are organized the way they are organized. Encourage them to identify other ways to organize the element models and if there is time, allow them to reorganize the plate models.
2. Review the meaning of structure and atomic structure.
3. Ask students how they would go about organizing the elements based on atomic structure. Allow them to brainstorm in small groups and then present their ideas to the class. The point of this discussion is to get them to see how sensible it is to organize the elements based on atomic number.
4. Review the meaning of energy level or shell.
5. Ask students to identify patterns or trends in the electrons found in the energy levels or shells.

Observations:

Evaluation:

Modifications:

This activity may be extended to include atomic size trends (atomic radius), electronegativity, etc. If this is done, be sure to include that information on the element cards distributed to the students.

Georgia Standards:

S8P1a, b, f; SCSH7a, b; SC3c; SC4a, b