

The Periodic Table of Students

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5-7-04

Purpose: To teach students in grade five how the elements of the periodic table are arranged by reactivity.

Introduction: Scientists who study the different atoms and molecules that make up the world and our universe are called chemists. Chemists figure out what things are made of by looking at properties of the things they study and how those things react. This activity is a game that shows how Chemists can organize different materials based on their reactivity.

Activity Overview: Nine students from class are called up to be mystery “elements” or substances with only one kind of atom. They are each given a card with directions on one side and their number on the other. After learning how to read cards the students may return to their desks, but must not show cards to other students. The director calls students to the front in pairs in a certain order and the rest of the class is asked to describe how each “element” reacted. The director writes down their suggestions on the board on a chart. When most of the reactions are complete, the director asks the students to estimate what reaction will occur when the last few get together, then the students get to check whether they are right or not.

Directions for Student “Elements”: Select 9 volunteers and tell them how to read cards, to put them around their necks with number showing, and to keep their instructions secret.

Cards:

- 1- When you react with students 2, 4, or 6, pat your head several times.
- 2- When you react with students 1, 3, or 7, turn around two times. When you see students 5, 8, or 9, sit on the floor.
- 3- When you react with students 2, 4, or 6, pat your head quickly.
- 4- When you react with students 1, 3, or 7, turn around one time slowly. When you react with students 5, 8, or 9, kneel on the floor.
- 5- When you react with students 2, 4, or 6, cover both eyes with your hands.
- 6- When you react with students 1, 3, or 7, turn around four times. When you react with students 5, 8, or 9, lay on the floor.
- 7- When you react with students 2, 4, or 6, pat your head very slowly.
- 8- When you react with students 2, 4, or 6, cover one eye with your hand.
- 9- When you react with students 2, 4, or 6, cover your whole face with your hands.

Directions for the Director:

Pass out the reaction data sheet to all students, including “elements”, and tell students to record how each element reacts with other elements it meets. Draw the data sheet and a blank 9 space grid/table on the board.

For each reaction, get two mystery elements together and have the class watch what happens. After, ask what each “element” did during the reaction. Write the student descriptions on the data sheet on the board and have students write their observations on their data sheets. Continually use the word “reaction.” Make sure you have most of the reaction possibilities

being covered as you go, but don't do too many "No Reaction" pairings. If you think you will get lost without a guide, do the reactions in this order: 7/2; 9/4; 1/6; 5/7; 4/3; 8/2. You will probably be able to get them guessing the trends when finished with this list, but if not, continue with 9/1; 5/6; 7/4; and 9/6.

Halfway through, have the students start thinking about trends. Introduce the nine-space table for organizing what we know about the nine mystery elements. The first step is to identify groups of elements with the similar kinds or types of reactions for each of the 3 columns. Using the data sheets ask the students to pick an element you've tested and identify the type of reaction(s) they saw (patting, turning, covering, sinking to floor). Put the type(s) at the top of a column. Identify some other types of reactions you've observed so far and if any particular elements had more than one type of reaction. (Some elements have more than one type of reaction, depending on what they react to, so the column heading for this group will have more than one type of reaction.) Keep going with the reactions if the types aren't clear. Ask which elements fall into the different reaction groups in the columns so far. Write these # above column heading.

When you have three elements that all have the same type of reaction, explain that the groups of elements can also be organized by how strongly each element in the group reacts. The elements that react most strongly have the highest reactivity and go at the top of the column. Ask students to work with the others at their desk to look at the group of three and arrange the elements from strongest reaction down to lowest reaction. Ask three different student groups to choose the element with the strongest, middle and lowest reactions in the group. Discuss reactions if there are differences of opinion.

Then ask students to guess what will happen with 5/4, 3/2, and 8/6. Fill in the table as they guess, then have the "element" students demonstrate what actually happens. See if the actual reaction fits either their guess or another trend they can recognize.

Conclusions: Have them focus on how they ordered things by the extent and manner in which it reacted.

Key:

	Pat head	Turn around/go toward floor	Cover face
Trend			
Reactivity			
High	3	6	9
Medium	1	2	5
Low	7	4	8