

## Creating a Periodic Table

Mendeleev saw the need for a system of organizing elements that would include important information about them, and allow relationships between different elements to be easily seen. In this Investigation, you will be given information about some hypothetical elements, and create a system to arrange them.

### Question

Write a question for this Investigation.

### Design

You will be given information about some hypothetical elements and you will design a system to arrange these elements. Using your system, you will make a prediction about the properties of (an) unknown element(s).

### Materials

- set of 20 to 24 blank cards (per group)

### Procedure

1. Work with a group.

Examine the list of 16 imaginary elements and their properties in Table 1. Write the symbol and properties of each element on a card (Figure 1).

<b>H</b>
Mass—64.0 g
Density—9.0 g/cm <sup>3</sup>
State—solid
Reactivity—tarnishes slowly
Electrical Conductivity—good

Figure 1

2. Mass will be the most important property in your arrangement. Rank the rest of the properties in order of importance.
3. Arrange the element cards in groups, based on your property ranking in step 2. You may choose to use blank cards to fill in gaps in your arrangement.
4. Draw a diagram of your arrangement.
5. If you have gaps in your arrangement, make a prediction about the properties of the unknown element(s).

### INQUIRY SKILLS

- |  |  |  |
|--|--|--|
| <input checked="" type="radio"/> Questioning | <input type="radio"/> Conducting           | <input checked="" type="radio"/> Evaluating    |
| <input type="radio"/> Hypothesizing          | <input type="radio"/> Recording            | <input type="radio"/> Synthesizing             |
| <input checked="" type="radio"/> Predicting  | <input checked="" type="radio"/> Analyzing | <input checked="" type="radio"/> Communicating |
| <input checked="" type="radio"/> Planning    |  |  |

Table 1

Element (symbol)	Mass (g)	Density (g/cm <sup>3</sup> )	State	Reactivity	Electrical conductivity
litium (L)	4.0	0.2	gas	none	poor
fermium (F)	7.0	0.5	solid	reacts with water	good
langium (La)	11.0	2.3	solid	reacts with oxygen	good
orcium (O)	14.0	1.3	gas	low	poor
weirdium (W)	16.0	1.4	gas	reacts with most metals	poor
clownium (Cl)	20.0	0.9	gas	none	poor
probiom (P)	27.0	2.7	solid	reacts with oxygen	good
albertium (A)	28.0	2.5	solid	low	fair
marium (M)	31.0	1.8	solid	low	poor
iremium (I)	32.0	2.1	solid	reacts with most metals	poor
bearium (Br)	40.0	0.9	solid	reacts with water	good
spuzzium (S)	56.0	7.9	solid	tarnishes quickly	good
atlium (At)	59.0	8.9	solid	does not tarnish	good
heavium (H)	64.0	9.0	solid	tarnishes slowly	good
densium (D)	70.0	5.9	solid	reacts with oxygen	good
salmoium (Sa)	73.0	5.4	solid	low	fair

### Analysis

- (a) What was your ranked order of properties?
- (b) Was there a pattern of repeating properties?
- (c) What were your predicted properties for the unknown element(s)?
- (d) Compare your arrangement to other groups. How are they the same? How are they different?
- (e) Compare your predictions for the unknown element(s) to those of another group. How are they the same? How are they different?

### Evaluation

- (f) How would you improve your arrangement? Draw a diagram of your improved arrangement.