

**Data Table:**

## Classification of the elements

At. No.	Element	Symbol	Physical State	Color	Conductivity (yes or no)	Classification of the element	Family
13	Aluminum						
51	Antimony				Poor		
18	Argon				No		
33	Arsenic				Poor		
83	Bismuth				Yes		
35	Bromine				No		
20	Calcium				Yes		
6	Carbon						
17	Chlorine				No		
24	Chromium						
29	Copper						
2	Helium				No		
53	Iodine				No		
26	Iron						
82	Lead						
3	Lithium				yes		
12	Magnesium						
25	Manganese						
80	Mercury				Yes		
28	Nickel						
7	Nitrogen				No		
8	Oxygen				No		
15	Phosphorus				No		
19	Potassium				yes		
34	Selenium				No		
14	Silicon				Poor		
47	Silver						
11	Sodium				yes		
16	Sulfur						
50	Tin						
30	Zinc						

## Physical Properties of the Elements

The purpose of this experiment is to observe some of the physical properties of some selected elements such as conductivity, color, and state and to classify elements based on these properties.

### **Materials:**

Elements set, conductivity tester

### **Procedure:**

Observe each of the elements in your “Elements Set” recording the following properties of each element in the space provided in the Data Table.

1. Record the symbol of the element as specified on its label.
2. Observe the element in its container. Give its physical state such as solid, liquid, or gas and its color.
3. If the element is stored in a vial, remove the cap and test its conductivity by pressing the leads of the conductivity tester firmly against the element. Record the conductivity as “yes” it does conduct or “no,” it does not conduct.

When you have determined the properties of each element in the set, return the element set and the conductivity tester to the location specified by your teacher.

### **Questions:**

- Q1. For each element studied, find the element on a periodic table of the elements. Give its family, IA, IIA, IB, etc., and the type or classification of element; metal, nonmetal, semimetal (metalloid), or noble gas.
- Q2. Identify which elements in your element set are alkali elements, alkaline earth elements, transition elements, halogens, or noble gases.
- Q3. What are some of the general properties of the metals you observed?
- Q4. What are some of the general properties of the nonmetals you observed?
- Q5. Neither titanium nor fluorine were included in your element set, but if they were present, what would be some of their properties?
- Q6. What are allotropes? Which elements in your element set are allotropes?
- Q7. According to your measurements, how could you use conductivity to classify an element?
- Q8. Which element did you find the most interesting and why?
- Q9. An unknown element is a colorless gas, does not conduct electricity, and does not seem to react with any of the other elements. In which family on the Periodic Table would you place this element?
- Q10. Were there any surprises in the conductivity of the elements tested? Since the conductivity of solids is caused by mobile or loosely bound electrons, what can you conclude about some of the electrons in this solid?