

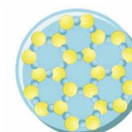
## CONCEPT: PERIODIC TABLE: PHASES (SIMPLIFIED)

● At standard room temperature (25 °C) and pressure (1 atmosphere), the elements can exist under 3 states of matter.

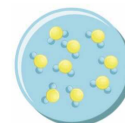
- **Solids:** Maintain a fixed \_\_\_\_\_ and \_\_\_\_\_.
- **Liquids:** Conform to the \_\_\_\_\_ of a container, but not the \_\_\_\_\_.
- **Gases:** Assume both the shape and volume of a container.

|                          |                 |                 |                     |                |                  |                  |                 |                  |                    |                   |                   |                |                 |                 |                   |                  |                 |
|--------------------------|-----------------|-----------------|---------------------|----------------|------------------|------------------|-----------------|------------------|--------------------|-------------------|-------------------|----------------|-----------------|-----------------|-------------------|------------------|-----------------|
| 1A<br>(1)                |                 |                 |                     |                |                  |                  |                 |                  |                    |                   |                   |                |                 |                 |                   |                  | 8A<br>(18)      |
| 1<br>1<br>H<br>Hydrogen  | 2A<br>(2)       |                 |                     |                |                  |                  |                 |                  |                    |                   |                   | 3A<br>(13)     | 4A<br>(14)      | 5A<br>(15)      | 6A<br>(16)        | 7A<br>(17)       | He<br>Helium    |
| 2<br>2<br>Li<br>Lithium  | Be<br>Beryllium | 3B              | 4B                  | 5B             | 6B               | 7B               | 8B              |                  |                    | 1B                | 2B                | B<br>Boron     | C<br>Carbon     | N<br>Nitrogen   | O<br>Oxygen       | F<br>Fluorine    | Ne<br>Neon      |
| 3<br>3<br>Na<br>Sodium   | Mg<br>Magnesium | (3)             | (4)                 | (5)            | (6)              | (7)              | (8)             | (9)              | (10)               | (11)              | (12)              | Al<br>Aluminum | Si<br>Silicon   | P<br>Phosphorus | S<br>Sulfur       | Cl<br>Chlorine   | Ar<br>Argon     |
| 4<br>4<br>K<br>Potassium | Ca<br>Calcium   | Sc<br>Scandium  | Ti<br>Titanium      | V<br>Vanadium  | Cr<br>Chromium   | Mn<br>Manganese  | Fe<br>Iron      | Co<br>Cobalt     | Ni<br>Nickel       | Cu<br>Copper      | Zn<br>Zinc        | Ga<br>Gallium  | Ge<br>Germanium | As<br>Arsenic   | Se<br>Selenium    | Br<br>Bromine    | Kr<br>Krypton   |
| 5<br>5<br>Rb<br>Rubidium | Sr<br>Strontium | Y<br>Yttrium    | Zr<br>Zirconium     | Nb<br>Niobium  | Mo<br>Molybdenum | Tc<br>Technetium | Ru<br>Ruthenium | Rh<br>Rhodium    | Pd<br>Palladium    | Ag<br>Silver      | Cd<br>Cadmium     | In<br>Indium   | Sn<br>Tin       | Sb<br>Antimony  | Te<br>Tellurium   | I<br>Iodine      | Xe<br>Xenon     |
| 6<br>6<br>Cs<br>Cesium   | Ba<br>Barium    | La<br>Lanthanum | Hf<br>Hafnium       | Ta<br>Tantalum | W<br>Tungsten    | Re<br>Rhenium    | Os<br>Osmium    | Ir<br>Iridium    | Pt<br>Platinum     | Au<br>Gold        | Hg<br>Mercury     | Tl<br>Thallium | Pb<br>Lead      | Bi<br>Bismuth   | Po<br>Polonium    | At<br>Astatine   | Rn<br>Radon     |
| 7<br>7<br>Fr<br>Francium | Ra<br>Radium    | Ac<br>Actinium  | Rf<br>Rutherfordium | Db<br>Dubnium  | Sg<br>Seaborgium | Bh<br>Bohrium    | Hs<br>Hassium   | Mt<br>Meitnerium | Ds<br>Darmstadtium | Rg<br>Roentgenium | Cn<br>Copernicium | Nh<br>Nihonium | Fl<br>Flerovium | Mc<br>Moscovium | Lv<br>Livermorium | Ts<br>Tennessine | Og<br>Oganesson |

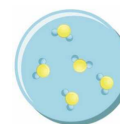
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|---------------|--------------------|-----------------|------------------|-----------------|-----------------|------------------|-----------------|-------------------|-------------------|---------------|-------------------|-----------------|------------------|
| Ce<br>Cerium  | Pr<br>Praseodymium | Nd<br>Neodymium | Pm<br>Promethium | Sm<br>Samarium  | Eu<br>Europium  | Gd<br>Gadolinium | Tb<br>Terbium   | Dy<br>Dysprosium  | Ho<br>Holmium     | Er<br>Erbium  | Tm<br>Thulium     | Yb<br>Ytterbium | Lu<br>Lutetium   |
| Th<br>Thorium | Pa<br>Protactinium | U<br>Uranium    | Np<br>Neptunium  | Pu<br>Plutonium | Am<br>Americium | Cm<br>Curium     | Bk<br>Berkelium | Cf<br>Californium | Es<br>Einsteinium | Fm<br>Fermium | Md<br>Mendelevium | No<br>Nobelium  | Lr<br>Lawrencium |



Solid



Liquid



Gas

**EXAMPLE:** Identify the element that is a representative element that is not diatomic in the 2<sup>nd</sup> Period that assumes the shape and volume of the container that it is in:

- a) Beryllium                      b) Silicon                      c) Boron                      d) Neon                      e) Argon

**PRACTICE:** Which of the following elements is a nonmetal that is a homonuclear polyatomic solid?

- a) Carbon                      b) Oxygen                      c) Sulfur                      d) Radon                      e) Cesium

**PRACTICE:** Which of the following exists as a diatomic solid at room temperature?

- a) Bromine                      b) Tellurium                      c) Sulfur                      d) Chlorine                      e) Iodine