

## Classroom Activity: Atomic Bonding Challenge

### Materials:

- Paper plates
- Markers
- Brass fasteners
- Hole punch

### Procedure:

1. Have each student take a paper plate for their assigned atom.
2. Write the symbol for the atom in the center of the paper plate.
3. Draw the appropriate number of valence shells around the nucleus.
4. Draw small dots with a marker to indicate the placement of electrons in the valence shells, draw a dot for full valence shells even if the valence shell is not full (so that the atom can receive atoms in an ionic bond, if that applies).
5. Punch holes where each of the electron dots is located.
6. Place a brass fastener in each hole to represent the electrons that atom has (some holes may be empty in the outer valence shell, of course).
7. Have students move about the room to connect with other students and see how their atoms fit together, if at all. Once two students partner up in a bond that works, they are "safe" and the last person (or two people if you have an even number of students) who does not quickly and correctly partner up is "out" for that game. Ask students: "Can you tell me what numbers would go in each box?" Vary the location of the empty boxes.

The point of using the brass fasteners is so that when students create bonds, they can fasten their atoms together to show either a covalent or ionic bond between the atoms.

This example shows atoms forming a covalent bond of Fluoride–Fluoride, as students would draw them on their paper plates and connect them. The black circles represent the valence shells as they would be drawn on the plates, and the red circles represent the correct placement of brass fasteners on the plates.

