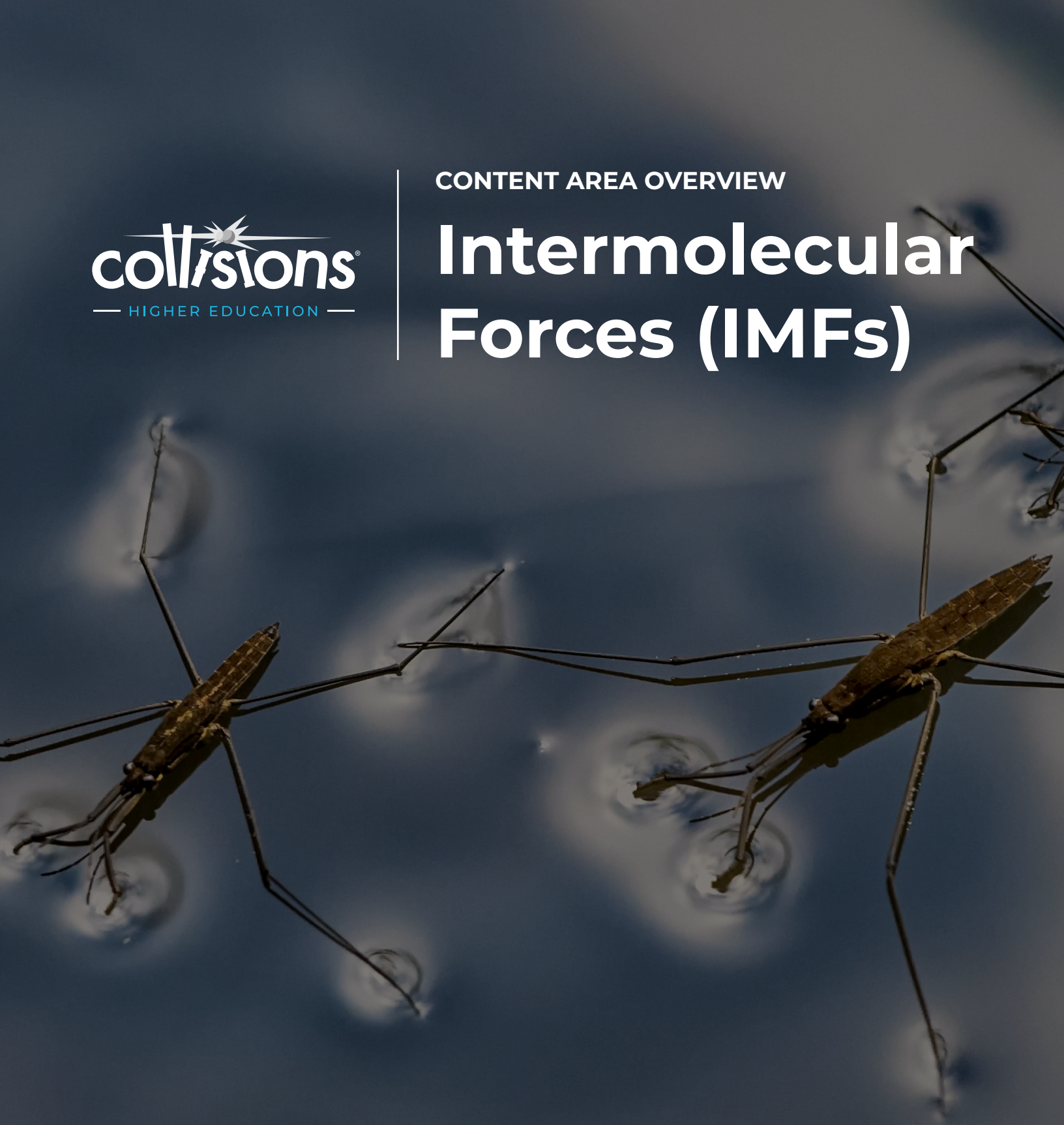
COLLISIONS
HIGHER EDUCATION

CONTENT AREA OVERVIEW

Intermolecular Forces (IMFs)



playmada™

SNAPSHOT

Challenges

- The Challenge Levels increase in rigor and complexity.
- The first 6 levels are tutorial levels.
  - 17 core levels
  - 3 connected levels to Radii Trends
  - 3 connected levels to Lewis Structures.

Sandbox

- The Sandbox is an exploratory learning space for extended practice and review of Lewis Structures.
- 12 Achievements

Integrated Chemistry Concepts

- Polar and Nonpolar Bonds
- Molecular Geometry and Polarity
- Polar and Nonpolar Molecules
- London Dispersion Forces
- Dipole-Dipole Forces
- Hydrogen Bonds
- Intermolecular Force Strength

GAMEPLAY BASICS

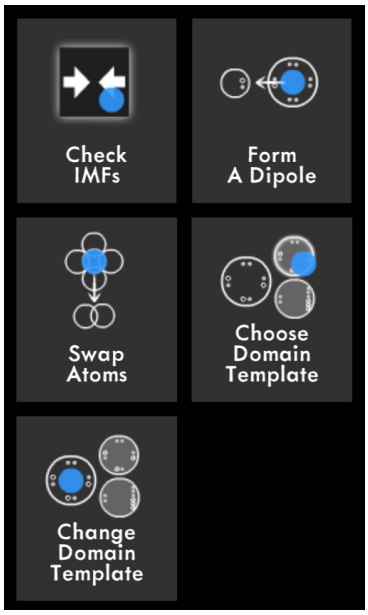
IMF Types

HYDROGEN BOND

DIPOLE-DIPOLE

LONDON DISPERSION FORCES

Skills



OVERVIEW

Intermolecular Forces Sandbox

Achievements

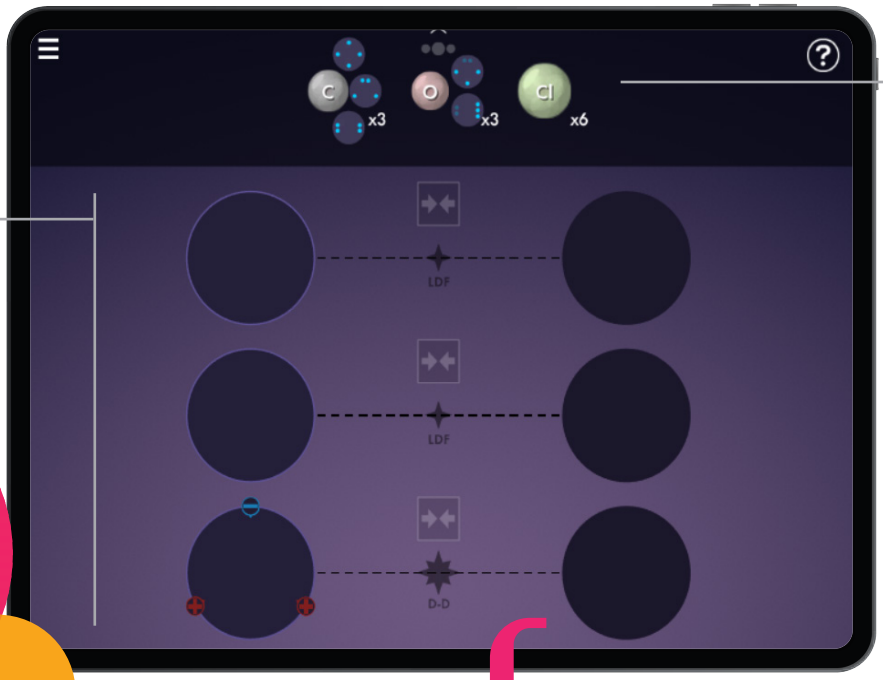
- IMFs Between He
- IMFs Between BrF
- IMFs Between H_2O
- Diatomic Non-Polar
- Diatomic Polar
- Tetrahedral Non-Polar
- Tetrahedral Polar
- London Dispersion Force
- Dipole-Dipole
- Hydrogen Bond
- Weaker IMFs than HF
- Weaker IMFs than CH_4

Selected Bank of Atoms

The bank includes the following atoms:

H	F
He	Cl
C	Ar
N	Br
O	Xe
S	

OVERVIEW

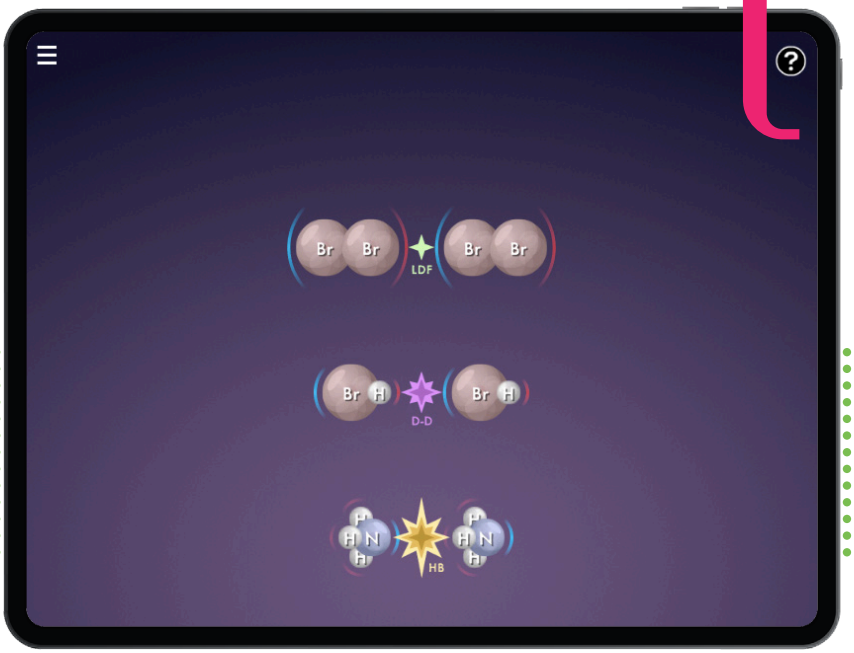


RESTRICTED BANK OF ATOMS

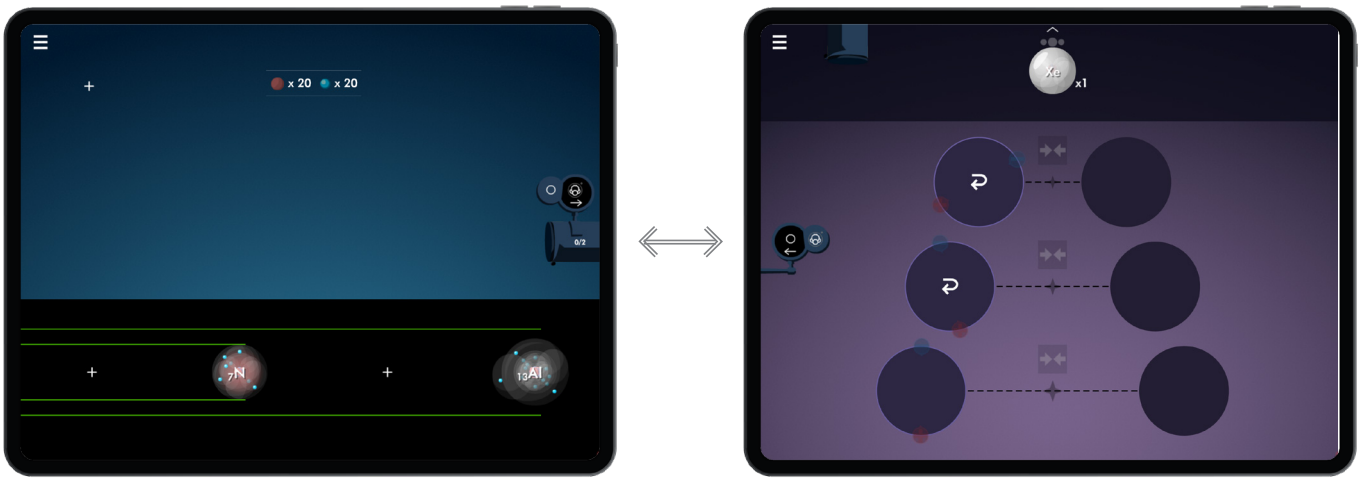
LEVEL TARGETS

Intermolecular Forces Challenges

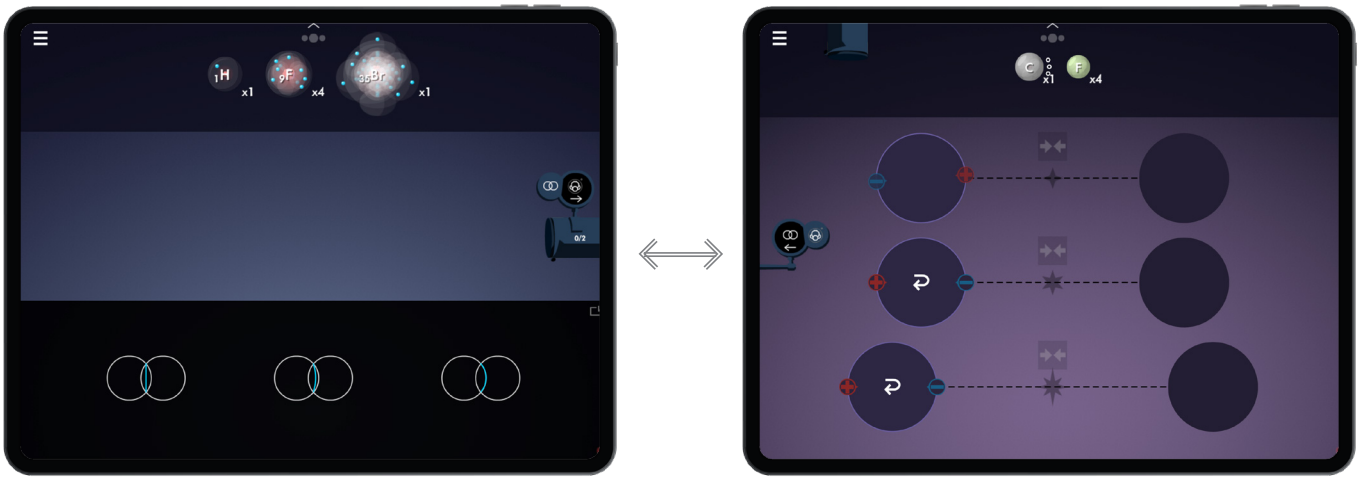
LEVELS 1-17 GOAL: Build molecules to form IMFs that match the type and strength of the targets.



OVERVIEW



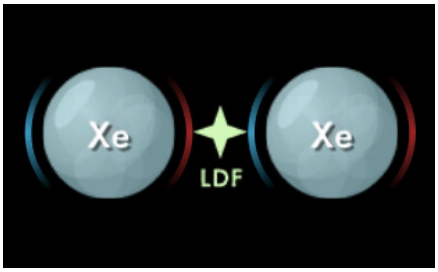
RADII TRENDS to IMFs CONNECTED LEVELS GOAL:
There are atoms missing from the bank. Use the button on the left to go to Radii Trends. Solve the Challenge and bring back the missing atoms!

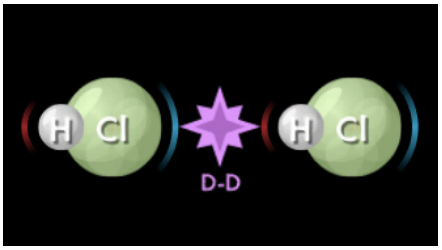


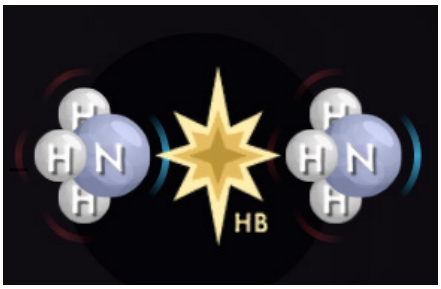
LEWIS STRUCTURES to IMFs CONNECTED LEVELS GOAL:
There are molecules missing from the bank. Use the button on the left to go to Lewis Structures. Solve the Challenge and bring back the missing molecules!

CHEMISTRY CONNECTIONS

CHEMISTRY CONCEPT: Intermolecular forces (IMFs) are interactions between two atoms or molecules.







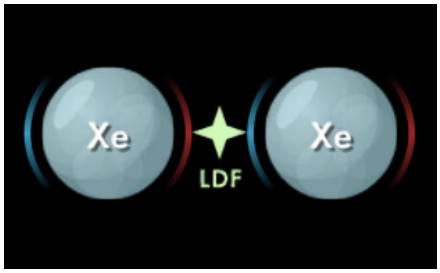
A POLAR MOLECULE IS NOT SYMMETRICAL AND HAS AN UNEVEN DISTRIBUTION OF ELECTRONS.

A NON-POLAR MOLECULE IS SYMMETRICAL AND HAS AN EVEN DISTRIBUTION OF ELECTRONS.

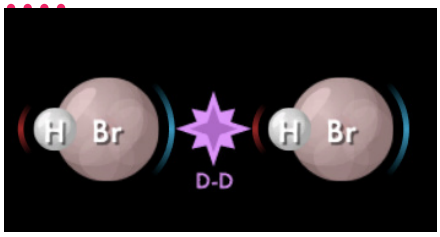
CHEMISTRY CONCEPT: Polar and Nonpolar Molecules

CHEMISTRY CONNECTIONS

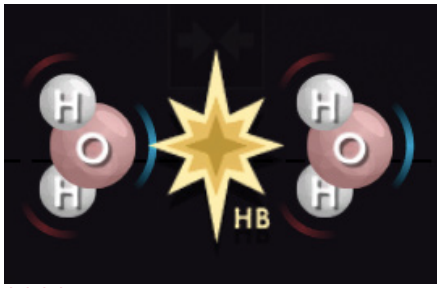
Chemistry Concept: IMF Types



London Dispersion Forces ( ) are temporary dipoles resulting from the constant movement of electrons.



Dipole-Dipole ( ) interactions result between two polar molecules.



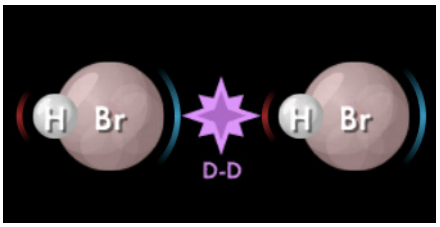
Hydrogen Bonding ( ) results from the attractive force between a hydrogen atom covalently bonded to a very electronegative atom such as an N, O, or F atom and another very electronegative atom.

CHEMISTRY CONNECTIONS

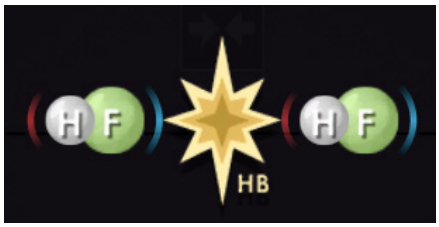
CHEMISTRY CONCEPT:
IMF Strength Comparison

WEAKEST → STRONGEST

LDF



DIPOLE-DIPOLE

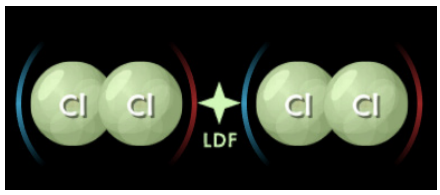


HYDROGEN BOND

CHEMISTRY CONCEPT:
LDF strength increases as the number of electrons increase.

WEAKEST → STRONGEST

18 ELECTRONS



34 ELECTRONS

54 ELECTRONS