

Types of Chemical Bonds and Intermolecular Forces

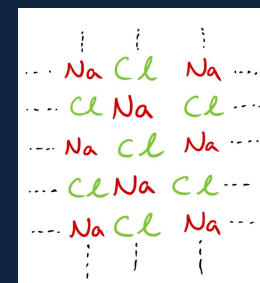
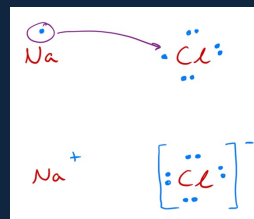
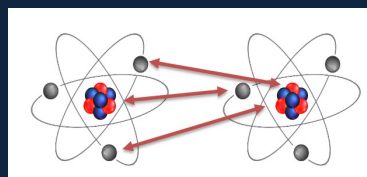
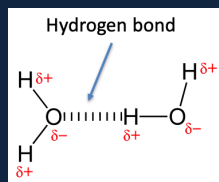


5E Lesson



The 5E model is a scientifically proven method to improve student engagement and learning in your classroom

- ✓ Engagement
- ✓ Exploration
- ✓ Explanation
- ✓ Elaborate
- ✓ Evaluate



Complete Teacher Instructions



Types of Chemical Bonds and Intermolecular Forces 5E Lesson

Grades 11-12 | Types of Chemical Bonds and Intermolecular Forces | Ongoing Lesson (4-6 hours)

Lesson Objective:

Students will learn about the following topics:

- Forces of attraction
- Ionic vs. Covalent bonds
- Ionic bonds overview
- Covalent bonds
- Single, double, and triple bonds
- Polar covalent bonds
- Metallic bonds
- The four types of intermolecular forces
- Dispersion forces
- Molecular dipole
- Dipole-dipole forces
- Impact of intermolecular forces on melting and boiling points
- Hydrogen Bonds

Possible Student Misconceptions:

- Molecular bonds are the strongest type of bond
- There's no force of attraction within atoms
- Single bonds are stronger than double bonds
- Dipole bonds are not strong

Materials:

- 1 device (smartphone, Chromebook, laptop, tablet, or computer) per 3 students
- A means of projecting a presentation
- Internet access
- General classroom objects

Teacher Notes:

- The presentations as well as the student notes are in Google and Office format which can easily be used in class or online
- All videos can be accessed directly from the presentation. To retrieve them, click on the icon while in slideshow mode and it will automatically open for you. If it doesn't for some reason, right-click on the image and click **Edit Hyperlink** or something similar.
- I've created a video walkthrough if needed. It can be accessed here - <https://youtu.be/oCIKIP9SaDQ>
- I don't believe in long lessons. If you feel your students are losing their focus, don't force it. Stop the presentation and give them a 5-minute break. If you'd like to show a quick video, I recommend my video collection here - <http://www.teachwithfergy.com/science-videos/>. There are tons of brain-break videos to choose from all grouped by category.

Types of Chemical Bonds and Intermolecular Forces - 5E Lesson

Engagement Phase

Your students will watch the video located in the file 'Engagement Phase' and answer the associated questions.

Teacher Notes:

- I've included two reading levels so you can decide what level your students should get. You can also differentiate between students of different levels if you prefer.
- The reading is a good way to introduce cells to your students

Duration: 50 minutes

Teacher Role – Facilitate learning and guide student understanding

Goals

- ☐ Connect student's experiences
- ☐ Create interest
- ☐ Ask questions
- ☐ Understand the objectives of the lesson

Exploration Phase

Exploration – Lab Station Activity

- In groups of 2-3, have your students complete the Station Activity. Once they're done, they will present to you.

Teacher Notes:

- The complete instructions for my Lab Station are found in the START HERE – Instructions

Duration: 1 hour

Elaborate Phase

Elaborate – Scavenger Hunt

Your students will complete – Elaborate – Scavenger Hunt. This activity will require your students to move beyond what was covered directly in the lesson and allow them to further develop their understanding.

Teacher Notes:

- Students will work individually or in small groups
- Students will need one device per group

Duration: 1 hour

Teacher Role – Facilitate learning and keep students focused

Goal

- ☐ Students use their newly obtained knowledge to propose solutions and extend their learning to new situations

Evaluate Phase

Quiz

Have your students complete one or both of - Evaluate – Types of Chemical Bonds Exit Ticket and Review Activity and/or Intermolecular Forces Exit Ticket and Review Activity Quiz

Teacher Notes:

- The quizzes will be completed on Google Forms and will be automatically graded. This
 - 1) Provide immediate feedback on the questions they just completed
 - 2) Significantly reduce your marking time

Duration: 10 – 20 min

Teacher Role – Distribute and collect evaluation

Goal

- ☐ Students are given the opportunity to demonstrate their understanding and evaluate their own progress

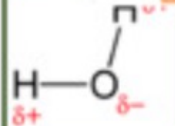
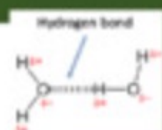
Each phase is clearly described

Two Complete Lessons

TWF

Intermolecular Forces

- The Four Types of Intermolecular Forces
- Dispersion Forces
- Molecular Dipole
- Dipole-Dipole Forces
- Impact of Intermolecular Forces on Melting and Boiling points
- Hydrogen Bonds
- Bonding Type Overview

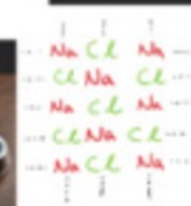
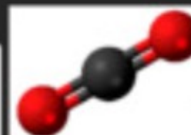


TWF

This digital presentation includes both Google and Office resources and is Google Classroom Ready

Types of Chemical Bonds

- Forces of Attraction
- Ionic vs. Covalent Bonds
- Ionic Bonds Overview
- Covalent Bonds
- Single, Double and Triple Bonds
- Polar Covalent Bonds
- Metallic Bonds



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Interactive and Engaging Activities

TWF

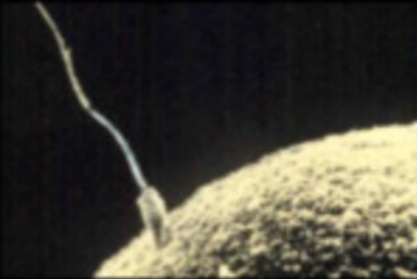
Device-Based Scavenger Hunt
Types of Chemical Bonds

Includes

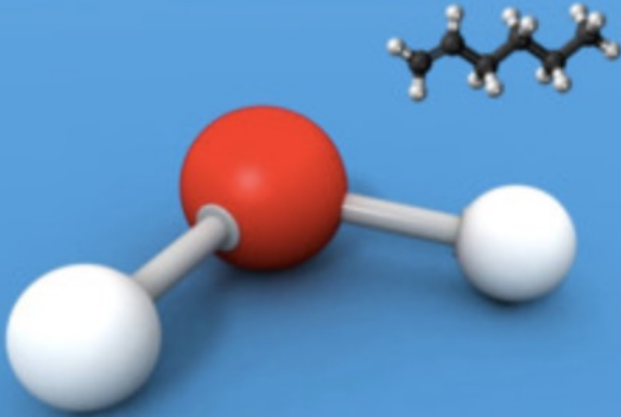
- 5 Unique Locations
- Online form submission
- Answer Key

Works on all smartphones, tablets, Chromebooks, and laptops

- **100% Digital**
- Simulations
- Quizzes
- Videos
- Games
- and more



Types of Chemical Bonds
Lab Station Activity



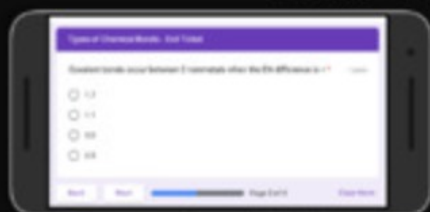
7 Lab Station Activities to get your kids out of their seats and engaged in their learning

Automatically Graded Assessments

TWF

Types of Chemical Bonds

Exit Ticket



- ✓ One-click to place the form in your Google Drive
- ✓ Includes 4 topic-specific questions
- ✓ Automatically graded and data presented via graphs
- ✓ Can be accessed from any device or projected to class
- ✓ Can be used as exit tickets or start of class review

TWF

Intermolecular Forces

Exit Ticket



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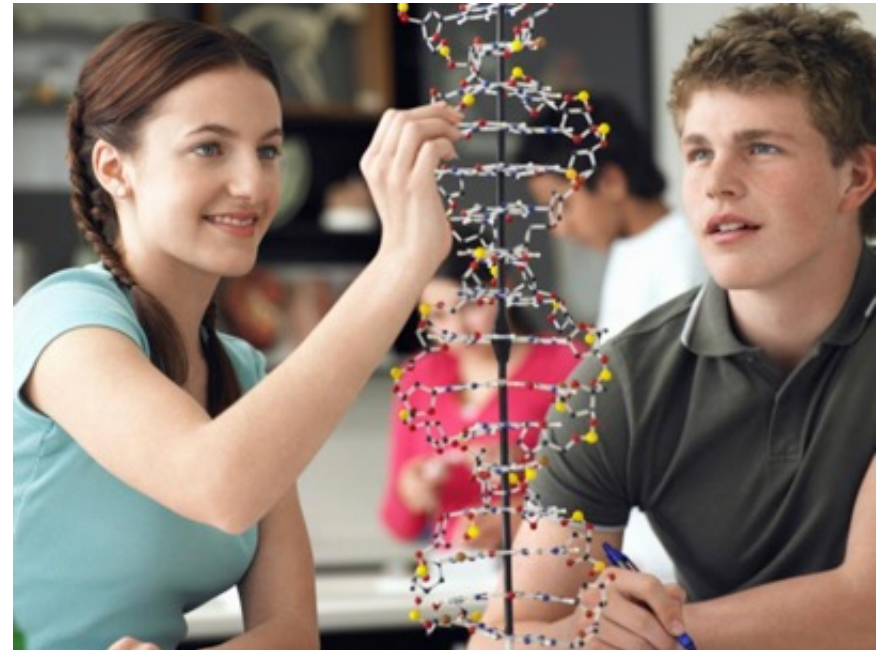
Get away from tired practices and unengaged students



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Provide a Scientifically-Proven means of instruction

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Incorporate Technology and Increase Collaboration



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