

Molecular and Ionic Compounds

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

Molecular and Ionic Compounds – 5E Lesson

Grades 8-11	Molecular and Ionic Compounds	Ongoing Lesson (5E)
Lesson Objective: Students learn about: - Ions - Ionic compounds - Drawing ionic compounds - Naming ionic and molecular compounds - Writing the chemical formula for ionic and molecular compounds - The criss-cross rule - Multivalent compounds - Properties of ionic and molecular compounds - Diatomic gases		
Possible Student Misconceptions: - Molecular compounds are stronger than ionic - Electrons are shared in any kind of bond		
Materials: 1 device (smartphone, Chromebook, laptop, tablet, or computer) per 3 students - A means of projecting a PowerPoint presentation - Internet access		
Teacher Notes: - All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If it does not, 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, stop the PowerPoint and give them a 5-minute break. If you'd like to show a video, I have a video collection here - http://www.teachwithfergy.com/science are tons of brain-break videos to choose from all grouped by category.		

Molecular and Ionic Compounds – 5E Lesson

Engagement Phase As they're watching the video, have your students complete the questions found in the file – <i>Engagement – What is Light?</i> The video can be found here - http://www.teachwithfergy.com/chemical-bonding-ionic-vs-covalent-bonds/ Have your students answer the following two questions. - How does a covalent bond form? A covalent bond forms when atoms share electrons. - How does an ionic bond form? An ionic bond forms when atoms are held together by the attraction between opposite charges. You may need to show the video twice to your students or pause it when the answers come up. Teacher Notes: - The video is about two and half minutes long - If for some reason the video doesn't play, go to www.youtube.com and type in "Chemical Bonding - Ionic vs. Covalent Bonds Ricochet Science"	Duration: 10 minutes Teacher Role: Lead Learning Objective: Understand the difference between ionic and covalent bonds. ☐ C ☐ e ☐ C ☐ A ☐ U ☐ o
Exploration Phase Exploration – Lab Station Activity - The activity is found in the folder - <i>Exploration – Lab Station Activity</i> - Place your students into groups of 2-3, and have them complete it. Once they're done, they will submit their passport to you. Teacher Notes: - The complete instructions for the lab station activity can be found in the <i>START HERE – Instructions</i> file.	Duration: 15 minutes Teacher Role: Lead Learning Objective: Understand the difference between ionic and covalent bonds. ☐ S ☐ e ☐ S ☐ c ☐ S ☐ o ☐ r ☐ c

Explanation Phase - There are two lessons included, both be found in the folder – <i>Explanation – Lessons</i> - The lessons are designed to be completed over two – three days - There are many embedded videos and plenty of opportunity to engage, interact and check for your students' understanding throughout the lessons Teacher Notes: - All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If they don't open, right-click the image and select Edit Hyperlink. - I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/oCIKIP9SaDQ - I have also enclosed a .PDF version of both the teacher and student versions	Duration: 2 - 3 hour(s) Teacher Role – Explain the concepts by presenting the material found in the presentation. Goals - Students develop understanding of the content - Observations and experiences are discussed and critiqued - Students develop vocabulary - Students are able to connect the content presented to previous experiences
Elaborate Phase - Your students will complete – <i>Elaborate – Water Softener Reading</i> - This activity will require your students to move beyond what was covered directly in the lesson and allow them to develop a deeper understanding of the topic and it's applicability Teacher Notes: - Students will work individually or in groups of two	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 - Have your students complete - <i>Evaluate Ionic and Molecular Worksheet</i> Teacher Notes: - This worksheet will allow you to gauge your students' understanding of naming and writing formulas for both ionic and molecular compounds - It's sometimes best to have the students peer evaluate - Placing students in small groups and having them exchange papers to mark will accomplish two things - Provide immediate feedback on the worksheet they just completed - Significantly reduce your marking time - Peer evaluation is not needed, only suggested when appropriate	Duration: 30 - 40 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

- Informative and engaging
- Student copies with blanks
- Videos embedded right into your slideshow

Naming Multivalent Compounds

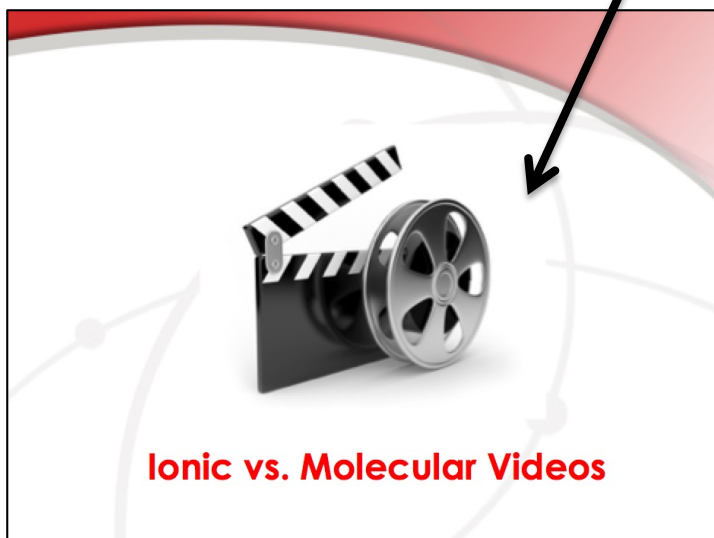
1) CuF
- Do the reverse of the criss cross method
- Take the subscript and use it as the charge on the opposite symbol
- Put the charge for the metal in brackets

$\text{Cu} \begin{array}{c} \nearrow 1 \\ \searrow 1 \end{array} \text{F}$ → _____

→ Copper (I) Fluoride

2) PbI_2
 $\text{Pb} \begin{array}{c} \nearrow 2 \\ \searrow 1 \end{array} \text{I}$ → _____

→ Lead (II) Iodide



Chemistry

Molecular Compounds

$\text{CH}_4 \cdot 6\text{H}_2\text{O}$

WATER MOLECULE

Methane hydrate structure

Chemistry

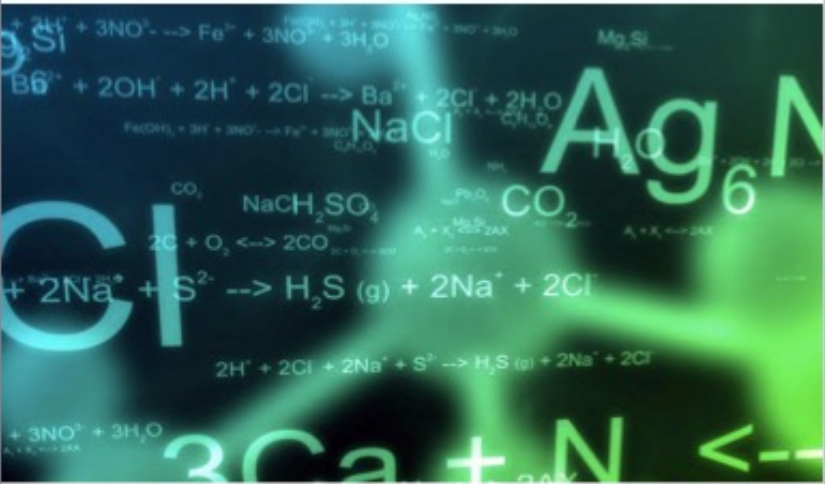
Ionic Compounds

Ionic Compound

Education, Pharmaceutical, Ethics, Environment, Polymers, Forensics, Business, Theology, Biochemistry, Computer, Physics, Chemistry, Biology, Medicine, Law, Technology, Agriculture

Engaging Activities including my Lab Station Activity and Water Softener Reading

**Molecular and Ionic Compounds
Lab Station Activity**



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

Get away from tired practices and unengaged students



Provide a Scientifically-Proven means of instruction



Incorporate Technology and Increase Collaboration

