

# Chemical Bonds & Equations

Chemical Bonds & Equations Unit includes:

- Print and digital Interactive Notebooks
- Editable Resources including notes, PowerPoints, and test
- Instructional Videos
- Teacher-led Demos & Guided Inquiry Labs
- Task Cards & Digital Task Cards
- Study Guides



The cover features a vibrant yellow background with a pattern of colorful molecular models (red, green, blue, pink spheres connected by lines) and various chemical equations and diagrams. A large, semi-transparent grey circle in the center contains the title 'CHEMICAL BONDS &amp; EQUATIONS' in white, bold, sans-serif capital letters. Below the title is a small logo for 'NITTY GRITTY SCIENCE' featuring a stylized bird or insect. The background also includes faint sketches of atomic models and chemical structures like benzene rings and alcohols.

# Suggested Pacing Guide



The following is a **suggested pacing guide** for my COMPLETE COURSES (Earth, Life or Physical Science) which are based on 50-minute class periods. There are three variations below. **Each variation is based on the number of sections in your SCIENCE INTERACTIVE NOTEBOOK chapter.**

Based on a **4-Section Chapter**

Day	Lesson/Activity	Engage	Explain	Explore	Elaborate	Evaluate
1	• Teacher Demo	x				
	• Section 1 Notes – INB input		x			
	• INB Activity – INB output (homework if not completed in class)			x		
2	• Mini-quiz					x
	• Section 2 Notes – use PowerPoint		x			
	• INB Activity			x		
3	• Mini-quiz					x
	• Guided Inquiry Lab – Student Led			x		
4	• Section 3 Notes – use PowerPoint		x			
	• INB Activity			x		
5	• Mini-quiz					x
	• Section 4 Notes – use PowerPoint		x			
	• INB Activity			x		
6	• Mini quiz					x
	• Science Stations				x	
7	• Science Stations				x	
8	• Final draft and testing for Creation Station (STEM)				x	x
9	• Task Card Review (game-style, full class, partner)				x	
10	• Chapter Test					x
	• Have students complete notes for next chapter*	x				

\* **Note-taking option:** Once students are done with chapter test, they get the next set of notes and work quietly on completing them while other students finish up. All notes are to be completed when they return to class. Have students glue each page of notes into the next few pages of their INB (right side only). This way, when you go over the PowerPoint each day, they have already reviewed topic and are ready for class.

## 5 E Model

**Engage** – Teacher-led demos foster wonder and classroom discussion and serve as the hook for the lesson. Videos and images of natural phenomena also foster questioning and communication. NGSS phenomena are aligned to middle school NGSS standards.

**Explain** – PowerPoints, instructional videos, and guided notes (input side of interactive notebooks) provide definitions, explanations, and information through mini-lecture, text, internet, and other resources which encourages students to explain concepts and definitions in their own words.

**Explore** – Students investigate problems, events, or situations. As a result of their mental and physical involvement in these activities, students question events, observe patterns, identify and test variables, and communicate results.

**Elaborate** – It is important to involve students in further experiences that apply, extend, or elaborate the concepts, processes, or skill they are learning. Elaborate activities provide time for students to apply their understanding of concepts and skills. They might apply their understanding to similar phenomena or problems.

**Evaluate** – Use a variety of assessment to gather evidence of student's understanding and provide opportunities for them to assess their own progress.

# Student Interactive Notebook

Each concept shares:

- Actual photos of both the INPUT and OUTPUT pages of Science Interactive Notebook
- Instructions on how to create/use/complete activity for OUTPUT side
- Mini-Quizzes for each concept to check students' understanding
- Answer Keys for all mini-quizzes
- Appendix with Teacher Notes for Interactive Notebook in LARGE print.

**Introduction**

If you are new to the idea of using a Science Interactive Notebook in your classroom, stop by my Nitty Gritty Science shop and check out my Science Interactive Notebooks tutorial for FREE! It will show you how to begin with your students, what materials to use, and how important it is to have a notebook, how it will enhance your students' learning, and how to be creative.

**Focused Lessons with Differentiated Instruction**

The lessons shared on the following pages cover the topics of chemical bonds, writing formulas, and chemical reactions. These lessons are designed to meet students' needs. I have given you the notes, activities, and worksheets that you can use in your classroom.

**Section 1: Types of Chemical Bonds**

**Directions:** Using the following terms or phrases, complete the concept map on Chemical Bonds, and then cut out and paste into your Science Interactive Notebook.

Force Shared	Atoms More stable Metal & Nonmetal	Chemical Bonds Nonmetal & Nonmetal Lost or Gained
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Name \_\_\_\_\_ Date \_\_\_\_\_

**Quiz: Types of Chemical Bonds**

Matching

1. A positively or negatively charged particle
2. A chemical bond between oppositely charged ions
3. A bond between atoms of the same element
4. A bond between atoms of different elements

a. Covalent Bond  
b. Compound  
c. Ion

**Section 2: Writing Formulas and Naming Compounds**

**Teacher Notes: Writing Formulas and Naming Compounds**

If the students make the foldables correctly, they should be able to use them perfectly on the boxes in the above printable. I have also included cut-outs for each of the foldables.

For my Science Interactive Notebook, these are the steps I use with my students:

**Writing Formulas:**

**Step 1:** Write the symbol of the element of the polyatomic ion and its charge.

**Step 2:** Write the symbol of the element of the polyatomic ion and its charge (nonmetals and polyatomic ions).

**Step 3:** Add subscripts so that the sum of the oxidation numbers of all atoms in the formula is zero - use the criss-cross method.

**Naming Compounds:**

**Step 1:** Write the name of the first element. \*Note: do not become part of the name for ionic compounds but determine prefixes when naming covalent compounds.

**Step 2:** Write the root of the name of the second element. Chlorine root is chlor-, oxygen root is ox-, bromine root is brom-.

**Step 3:** Add the ending -ide to the root. Examples: (Ions) Barium Fluoride,  $AlCl_3$  - Aluminum Chloride, (Covalent) Nitrogen Dioxide,  $CO$  - carbon monoxide.

**Section 3: Chemical Reactions**

**Instructions:**

There are actually two parts to this student output page of their Science Interactive Notebook. Part A has students cutting out terms and labeling the parts of a chemical equation. Part B asks students to study two different chemical equations and answer questions relating to the information found in each equation. Both parts have cut-out lines for students to cut and paste when they are finished.

A mini-quiz and a printable for the Parts of a Chemical Equation cut-out and worksheet are included.

**Layered Book Foldable x 2**

Step 1: Fold one sheet of paper in half horizontally and cut down the fold line so you end up with two sheets.

Step 2: Stack the two pieces on top of each other, cutting on the fold line so you end up with two sheets.

Step 3: Layer two sheets on top of each other, cutting on the fold line so you end up with two sheets. Staple on the fold to hold the sheets together.

There should now be two identical foldables. Paste your "Writing Formulas" and "Naming Compounds" foldables into the boxes.

**Writing Formulas**

**Naming Compounds**

Practice

1.  $Na^+$ ,  $Cl^-$
2.  $Zn^{+2}$ ,  $S^{-2}$
3.  $Zn^{+2}$ ,  $OH^-$
4.  $Al^{+3}$ ,  $Cl^-$
5.  $K^+$ ,  $PO_4^{-3}$
6.  $Pb^{+4}$ ,  $O^{-2}$
7.  $Mn^{+4}$ ,  $Br^-$
8.  $H^+$ ,  $Cl^-$

Practice

1.  $SnCl_6$
2.  $SiO_2$
3.  $CaCO_3$
4.  $SO_2$
5.  $PBr_3$
6.  $Mg(NO_3)_2$
7.  $P_2O_5$
8.  $CCl_4$

# Student Digital Notebook

The student notebook is on Google Drive and ready for you to share with your students. Here's a quick overview of the features:

Set up like a traditional interactive notebook with input and output sides.

Hyperlinked tabs so student can easily move through chapter for review

Students watch video < 6 min to complete notes.

The screenshot shows a digital notebook page with two columns. The left column contains instructions and steps for writing formulas and compounds. The right column contains a table of steps for writing formulas and naming compounds, with a play button icon for a video. A red arrow points from the text 'Students watch video < 6 min to complete notes.' to the play button icon. Another red arrow points from the text 'Hyperlinked tabs so student can easily move through chapter for review' to a vertical sidebar of tabs on the right side of the page. A third red arrow points from the text 'Set up like a traditional interactive notebook with input and output sides.' to the left side of the page. A fourth red arrow points from the text 'Notes are chunked into manageable sections with large spaces for textboxes' to the large text boxes in the right column. A fifth red arrow points from the text 'Encouraging independent learners. Directions for output side are here along with what they need to complete the activity.' to the left column. A sixth red arrow points from the text 'Some pages have links so students can go deeper into the topic if they need.' to a 'Polyatomic Ions Table' button at the bottom right of the page.

Directions: Unscramble the steps below and place in the correct order. Use the steps to help you complete the practice problems.

Write the symbol of the element or polyatomic ion with the negative oxidation number (non-metals and polyatomic ions other than  $\text{NH}_4^+$ )

Add subscripts so that the sum of the oxidation numbers of all atoms in the formula is zero - use criss cross method (the charge without the sign) of one ion becomes the subscript of the other ion.

Write the symbol of the element or polyatomic ion (ions containing more than one atom) that has the positive oxidation number - hydrogen, ammonium ion ( $\text{NH}_4^+$ ), and metals.

Write the root of the name of the second element.

Write the name of the first element.  
NOTE: Subscripts do not become part of the name for ionic compounds but are used to determine prefix when naming covalent compounds.

Add the ending --ide to the root.

**STEPS TO WRITING FORMULAS**

1.  $\text{Na}^+$ ,  $\text{Cl}^-$
2.  $\text{Zn}^{2+}$ ,  $\text{S}^{2-}$
3.  $\text{Zn}^{2+}$ ,  $\text{OH}^-$
4.  $\text{Al}^{3+}$ ,  $\text{Cl}^-$
5.  $\text{K}^+$ ,  $\text{PO}_4^{3-}$
6.  $\text{Fe}^{3+}$ ,  $\text{O}^{2-}$
7.  $\text{Mg}^{2+}$ ,  $\text{Br}^-$
8.  $\text{K}^+$ ,  $\text{Cl}^-$

**STEPS TO WRITING COMPOUNDS**

1.  $\text{Na}_2\text{O}$
2.  $\text{Na}_2\text{S}$
3.  $\text{CaCl}_2$
4.  $\text{SO}_2$
5.  $\text{PBr}_3$
6.  $\text{Hg}(\text{NO}_3)_2$
7.  $\text{P}_2\text{O}_5$
8.  $\text{CO}_2$

**WRITING FORMULAS & NAMING COMPOUNDS**

Binary compound-

Oxidation number-

Binary ionic compounds will have a net charge of \_\_\_\_\_

Polyatomic ions -

✓ What does the prefix poly- mean?

Hydrate-

Covalent compounds can form \_\_\_\_\_ compound with each other. Scientists use Greek to indicate # of atoms in binary compounds.

✓ What would a chemist name the compound  $\text{PBr}_3$ ?

**CHEMICAL IONICS**  
**FORMULAS & COMPOUNDS**  
**CHEMICAL REACTIONS**  
**BALANCING EQUATIONS**  
**REACTION TYPES, RATES**  
**CLASSROOM LIBRARY**

Writing Formulas and Naming Compounds

Digital Textbook

**PREFIXES FOR BINARY COVALENT COMPOUNDS**

# ATOMS	1	2	3	4	5	6	7	8
PREFIX	mono	di	tri	tetra	penta	hexa	hepta	octa

For further exploration, click button(s) below.

Polyatomic Ions Table

Encouraging independent learners. Directions for output side are here along with what they need to complete the activity.

Notes are chunked into manageable sections with large spaces for textboxes

Some pages have links so students can go deeper into the topic if they need.



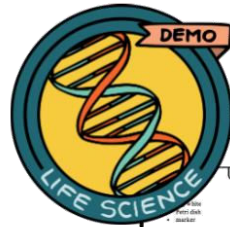
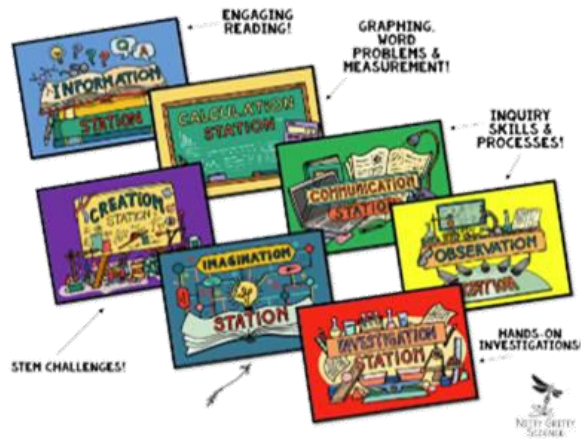
# Demos, Labs, & Science Stations

Working in the lab and being engaged in science experiments is the most exciting part of science.

Demo, Labs, and Science Stations Includes:

1. **SCIENCE STATION SIGNAGE** for all 7 stations is provided in color and in black and white (see preview) and all student answer sheets have icons that correspond with each station for ease of use.
2. **DEMONSTRATION** (teacher-led) allows teachers to invite scientific discussions and can help uncover misconceptions and, most importantly, lead to heightened curiosity and interest in the topic being studied.
3. **GUIDED INQUIRY LAB** which is a traditional lab that allows students to perform an investigation in order to solve a problem. Students will hypothesize, collect and analyze data and communicate their results.
4. **TEACHER GUIDES to DEMOS & SCIENCE STATIONS** help get you started and give you background information to make your science lessons engaging.
5. **7 SCIENCE STATIONS** which are designated locations in the classroom with activities that challenge students to extend their knowledge and elaborate on their science skills by working independently of the teacher in small groups or pairs. Stations included are:
  - **INFORMATION STATION** – Group members will read an interesting and relevant science passage then complete a task to help increase science literacy and deepen their understanding of the science concept.
  - **OBSERVATION STATION** – Group members will have images, illustrations, or actual samples at this station that show applications or processes of the science topic. Using what they've learned, they will need to apply their observation skills to complete the questions attached to each.
  - **CALCULATION STATION** – Group members use their math skills to complete the station challenge. Skills may include graphing, analyzing data, using models, measurement, and calculating formulas or word problems.
  - **INVESTIGATION STATION** – Group members will work with one another to explore the concept through hands-on activities so they may practice specific inquiry process skills as they learn.
  - **COMMUNICATION STATION** – There are three different options for this station: interviews, video, group essay. Depending on the option you choose, group members will communicate what they know by answering questions in creative ways.
  - **CREATION STATION** – Group members will work together to solve a STEM (Science, Technology, Engineering, Math) challenge by creating models or designs that demonstrate their understanding of the science topic being taught.
  - **IMAGINATION STATION** – This station makes science concepts relevant for students by asking them to imagine scenarios that will bring about discussion and critical thinking.
6. **INQUIRY PROCESS SKILLS CHECKLIST** is provided with each set to show teachers and administrators the inquiry skills used by students in each activity. These skills include, but are not limited to, communicating, creating models, inferring, classifying, identifying variables, measuring, observing, predicting, gathering and organizing data, comparing and contrasting, interpreting data, and manipulating materials.

# SCIENCE STATIONS



### Eye Safety

SCIENCE SKILLS AND LAB SAFETY

**Procedure:**

1. Draw an eye on the underside of the Petri dish and display for class using the projector.
2. Crack open the egg and place the egg white only in the Petri dish.
3. Explain that the proteins in egg whites are similar to those found in the protective layer of the eye.
4. Tell them that someone was not being cautious and has splashed acid into their eye - add drops of acid to the egg white.
5. Ask students to make observations of what is happening to the egg white.
6. Try adding water to reverse the effects. Have students make observations.

**What's Happening?**

The proteins in the egg white become cloudy when the acid is causing a denaturation of the proteins. This can't be reversed chemically because acid at this level is so strong that it is altering the way these proteins behave in their eyes or skin if not used properly. Students must be made aware of the safety procedures associated with such as wearing goggles, gloves and aprons. Make sure they are aware of safety equipment - eye wash station, shower, fire blanket, etc.

**Discussion:**

Q: What happened to the "eye"?

A: The protective layer became cloudy and damaged the eye.

Q: What types of safety equipment must be worn when doing Lab?

A: goggles, apron, hot this gloves

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Discussion questions and teacher set-up included!

Teacher guide and answer key offered for every lab!

Easy-to-get materials!



### Measure with SI Units

SCIENCE SKILLS AND LAB SAFETY

The standard system of measurement used by scientists around the world is known as the International System of Units, which is abbreviated as SI. SI units are easy to use because they are based on multiples of 10. Each unit is ten times larger than the next smallest unit and one-tenth the size of the next largest unit. The following table lists the prefixes used to name the most common SI units.

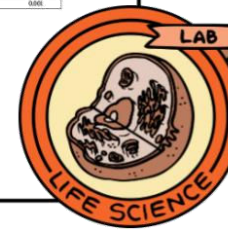
Prefix	Symbol	Abbreviation
Milli-	m	1/1000
Centi-	c	1/100
Deci-	d	1/10
Deci-	d	0.1
Centi-	c	0.01
Milli-	m	0.001

**Materials:**

- scattered seeds
- tape
- balance
- postage scale
- capsaicin (spicy) small milk cartons
- fertilizer solution
- metric ruler
- 50 mL graduated cylinder
- colored pencils

**Safety:**

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### Drip, Drop, Splat!

How does the density of a liquid and drop height affect the size and shape of droplet splatters?

**Materials:**

- colored water (graduated cylinder A)
- colored syrup (graduated cylinder B)
- eye dropper
- paper
- metric ruler
- meter stick

**Procedure:**

1. Make a hypothesis of how density of a liquid will affect splatter size on your lab sheet.
2. Place the piece of paper down on the lab table in order to catch splatters.
3. Measure the heights listed in the data table using a meter stick. Place meter stick with end starting at zero on paper and move up stick when increasing height of drop.
4. Use the eye dropper to drop ONE drop of colored water and ONE drop of colored syrup. Make sure to drop on different places on paper.
5. Measure the size of the splatter in MILLIMETERS. Record in data table on answer sheet.
6. Repeat for each height.
7. Use the collected data to graph the splatter size versus drop height for each liquid.

**Analyze and Conclude**

1. Was your hypothesis correct? Explain.
2. What are two controls in your experiment that helped you collect the most accurate data possible?

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**USER-FRIENDLY PAGES:**  
Students easily recognize which answer sheet to use at each station by matching station icons located on each page!!

Name \_\_\_\_\_ Date \_\_\_\_\_

**Hypothesis**

Drop Height (cm)

	3	25	50	75	100
Colored Water					
Colored Syrup					

Height of Drop vs. Splatter Size

Number of Drops (mm)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
--	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Legend

- Water
- Syrup

**Analyze and Conclude:**

1. \_\_\_\_\_
2. \_\_\_\_\_

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**TEACHERS SAVE TIME:**  
Laminate station pages and reuse for each class and for years to follow!  
Inquiry skills used are timeless!

# Instructional Videos

The Intro to Life Science Instructional Videos and Digital Assessments are designed to help teachers move instruction from the group learning space to the individual learning space. Not only does this give students independence in their learning, but it also allows more time for dynamic and interactive learning when teachers meet with students in a group setting.

This resource is perfect for:

- Flipped Classroom
- Absent students
- 1:1 Classrooms
- Sub Plans
- Hybrid Schedules
- Teachers who want more time to guide students as they apply concepts and engage creatively in the subject matter

Features of this resource include:

- Instructional videos which are six minutes or less to keep students focus
- Videos and assessments can be completed independently
- Auto grading and reporting in Google Forms
- Share link with students through educational platforms or email
- Quizzes are editable with 5 – 8 questions per quiz
- Information in video pairs with Nitty Gritty Science Interactive Notebooks

# Task Cards & Digital Task Cards

Task cards are a great tool for concept review that can be used in a variety of ways - pairs, small groups, team games, or individually. The reason they are so effective is there is only ONE task per card, allowing students to focus on that single task until they have successfully completed it. Answers sheet and answer key for teachers are included.

The digital, self-checking task cards are hosted at Boom Learning™ and are compatible with Google Classroom. These are perfect for displaying on your interactive whiteboard and leading class games or review sessions.

Print Task Cards

The print task cards are arranged in a stack, showing various question types:

- Card 1 (COMPLETE):** An atom has gained or lost electrons is called a(n) \_\_\_\_.
- Card 2 (DECIDE):** correct formula for oxide?
- Card 3 (COMPLETE):** What type of chemical reaction is:  $Mg + 2HCl \rightarrow MgCl_2 + H_2$   
a. synthesis
- Card 4 (COMPLETE):** Molecules that do NOT have oppositely charged ends are \_\_\_\_ molecules.
- Card 5 (DECIDE):** Which of the follow has GAINED an electron?  
a. negative ion  
b. positive ion  
c. nonpolar molecule  
d. polar molecule
- Card 6 (COMPLETE):** A \_\_\_\_ is formed when atoms gain, lose, or share electrons.
- Card 7 (DETERMINE):** Determine the name of the following covalent compound:  
 $AlCl_3$
- Card 8 (EXPLAIN):** Explain why some elements are stable on their own while others are more stable in compounds.
- Card 9 (IDENTIFY):** What does the following symbol mean in the following chemical equation?  
 $Li(s) + H_2O \rightarrow LiOH(aq) + H_2(g)$

Digital Task Cards

The digital task cards are interactive and feature a decorative border:

- Card 1:** A bond that forms between atoms when they share electrons is a(n) \_\_\_\_ bond.  
Buttons: polyatomic, electrical, cov
- Card 2:** Determine the total number of atoms in the following compound:
- Card 3:** Because a water molecule has a slight positive charge at one end and a slight negative charge at the other end, it is a \_\_\_\_ molecule.  
Diagram: A water molecule model with one red oxygen atom (O) and two white hydrogen atoms (H).  
Buttons: polar, nonpolar



# Study Guides: Includes *print* or *digital* options

Nitty Gritty Science Study Guides are directly aligned to the notes and assessments offered by Nitty Gritty Science and include a variety of review strategies which meet the needs of your learners for independent study and indirect instruction.

Each study guide provides a combination of strategies which may include:

- Graphic organizers
- Vocabulary building
- Compare and contrast
- Problem solving
- Concept mapping
- Interpreting data
- Critical thinking
- Theme connection
- Matching
- Fill-in-the-blank
- Short answer
- Real world application
- QR videos with accompanying questions

**SECTION 3**  
Directions: Complete the table by using each formula to identify the elements that each compound contains.

Formula	Element
NaOH	
NaCl	
H <sub>2</sub> O	
CaS	
Li <sub>2</sub> O	
SO <sub>2</sub>	

Directions: Write the prefixes for each compound.

# of atoms	Prefix

Directions: Answer the questions below and then fill in the graphic organizer with the correct steps used to balance the equation.

How do you know when an equation is balanced?

Step 1

Step 2

Step 3

Step 4

Directions: Balance this equation.

$$\text{Li (s)} + \text{H}_2\text{O} \rightarrow$$

**SECTION 4**  
Directions: Fill in the graphic organizer below with the correct definition for each term.

Chemical Reactions

Reactants

**SECTION 5**  
Directions: Answer the questions below using this equation.

$$\text{NiCl}_2 (\text{aq}) + 2\text{NaOH} (\text{aq}) \rightarrow \text{Ni}(\text{OH})_2 (\text{s}) + 2\text{NaCl} (\text{aq})$$

1. What is a chemical equation?

2. What are the reactants in this equation?


**SECTION 6**  
Directions: Identify which type of reaction is represented by the formula and then explain what happens.

Formula	Type of Reaction
$A + B \rightarrow AB$	
$AB + CD \rightarrow AC + BD$	
$A + BC \rightarrow AC + B$ or $A + BC \rightarrow AB + C$	
$AB \rightarrow A + B$	

Directions: Decide if each reaction described is exothermic or (EN) endothermic and write the word in the space provided.

Reaction	Exothermic or Endothermic
Melting ice cubes	
Burning coal	
Fireworks exploding	
Dissolving salt in water	
Cooking an egg	
Photosynthesis	
Lighting a match	

**SECTION 7**  
Directions: Scan the QR code to watch the video below about how salt melts ice and then answer the questions below.



1. What are two uses of salt?

2. How does salt melt the ice?

3. What are some drawbacks to using salt on roads?

4. Why is sand used as an alternative to salt?

5. Why is salt better than sand?

6. What melts even better than salt and sand?

# Assessments:

Teachers can use a variety of assessments to evaluate student progress throughout the unit. The curriculum provides mini-quizzes for each Interactive Notebook chapter and an online assessments that goes with the instructional videos. The chapter test includes multiple choice, short answer, interpreting diagrams, and an essay.

The image displays two sample assessment pages. The top page is titled "Quiz: Writing Formulas and Naming Compounds" and includes a "Name" and "Date" line. Below this, it instructs students to "Write compound formulas from the following ions (use criss-cross method)" and "Name the following compounds using the prefix method." The quiz contains 10 numbered items, each with a blank line for the answer. The bottom page is a "CHAPTER TEST" with a "Name" and "Date" line. It features a "Multiple Choice" section with 10 questions, followed by "Short Answer" and "Interpreting Diagrams" sections. A red-bordered callout box at the top of the test page states: "EDITABLE CHAPTER TEST INCLUDES MULTIPLE CHOICE, FILL IN THE BLANK, INTERPRETING DIAGRAM, & SHORT ANSWERS QUESTIONS". A second red-bordered callout box at the bottom of the test page states: "ANSWER KEY INCLUDED - IMAGES ARE BLURRED FOR COPYRIGHT REASONS".

Name \_\_\_\_\_ Date \_\_\_\_\_

**Quiz: Writing Formulas and Naming Compounds**

Write compound formulas from the following ions (use criss-cross method):

1. Na <sup>+</sup> , Cl <sup>-</sup> _____	6. SO <sub>3</sub> _____
2. Zn <sup>+2</sup> , S <sup>-2</sup> _____	7. N <sub>2</sub> O <sub>5</sub> _____
3. K <sup>+</sup> , S <sup>-2</sup> _____	8. MgCl <sub>2</sub> _____
4. Mn <sup>+2</sup> , Br <sup>-</sup> _____	9. CO <sub>2</sub> _____
5. Fe <sup>+3</sup> , O <sup>-2</sup> _____	10. LiBr _____

-----

Name \_\_\_\_\_ Date \_\_\_\_\_

**Quiz: Writing Formulas and Naming Compounds**

Write compound formulas from the following ions (use criss-cross method):

1. Na <sup>+</sup> , Cl <sup>-</sup> _____	6. SO <sub>3</sub> _____
2. Zn <sup>+2</sup> , S <sup>-2</sup> _____	7. N <sub>2</sub> O <sub>5</sub> _____
3. K <sup>+</sup> , S <sup>-2</sup> _____	8. MgCl <sub>2</sub> _____
4. Mn <sup>+2</sup> , Br <sup>-</sup> _____	9. CO <sub>2</sub> _____
5. Fe <sup>+3</sup> , O <sup>-2</sup> _____	10. LiBr _____

**CHAPTER TEST**

Name \_\_\_\_\_ Date \_\_\_\_\_

**Multiple Choice**

1. The element that reacts with oxygen to form rust is \_\_\_\_\_

2. The element that reacts with oxygen to form carbon dioxide is \_\_\_\_\_

3. The element that reacts with oxygen to form water is \_\_\_\_\_

4. The element that reacts with oxygen to form sulfur dioxide is \_\_\_\_\_

5. The element that reacts with oxygen to form nitrogen dioxide is \_\_\_\_\_

6. The element that reacts with oxygen to form phosphorus pentoxide is \_\_\_\_\_

7. The element that reacts with oxygen to form dinitrogen pentoxide is \_\_\_\_\_

8. The element that reacts with oxygen to form tetraphosphorus decaoxide is \_\_\_\_\_

9. The element that reacts with oxygen to form hexaboron octoxide is \_\_\_\_\_

10. The element that reacts with oxygen to form diphosphorus pentoxide is \_\_\_\_\_

**Short Answer**

11. Write the chemical formula for the compound formed when sodium reacts with chlorine.

12. Write the chemical formula for the compound formed when calcium reacts with sulfur.

13. Write the chemical formula for the compound formed when aluminum reacts with oxygen.

14. Write the chemical formula for the compound formed when iron reacts with sulfur.

15. Write the chemical formula for the compound formed when zinc reacts with oxygen.

**Interpreting Diagrams**

16. The diagram below shows the structure of a molecule. Identify the molecule.

17. The diagram below shows the structure of a molecule. Identify the molecule.

18. The diagram below shows the structure of a molecule. Identify the molecule.

19. The diagram below shows the structure of a molecule. Identify the molecule.

20. The diagram below shows the structure of a molecule. Identify the molecule.

**Essay**

21. Explain the difference between a physical change and a chemical change.

22. Explain the difference between a reversible change and an irreversible change.

23. Explain the difference between a homogeneous mixture and a heterogeneous mixture.

24. Explain the difference between a pure substance and a mixture.

25. Explain the difference between an element and a compound.

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