

Unit Plan Daily Details

NOTE: The entire instructional day is pasted below, but you only need to prepare the last 50 minutes, starting at 'PART TWO.' The first half of the lesson is the synthesis of a lab students did the day before on Physical and Chemical Changes. The exit ticket referenced in the Evaluate is a formative assessment of Physical and Chemical changes and does not need to be given during this time.

Lesson 2 from Unit 3:

Lesson 2: Physical v. Chemical Changes and Elements & Compounds	
What	
Standards: <i>What knowledge and/or skills are students are working towards?</i>	Daily Objectives: <i>What will students do today?</i>
<p>7.6: The student knows that matter has physical and chemical properties and can undergo physical and chemical changes. The student is expected to:</p> <ul style="list-style-type: none"> • 7.6A: [S] distinguish between physical and chemical changes in matter. • SP6.1: The student can make claims based on evidence obtained from a variety of sources (such as their own investigations, models, and other stimuli such as diagrams or readings). <p>6.5: The student knows the differences between elements and compounds. The student is expected to:</p> <ul style="list-style-type: none"> • 6.5A: [S] know that an element is a pure substance represented by a chemical symbol and that a compound is a pure substance represented by a chemical formula. • SP6.1: The student can make claims based on evidence obtained from a variety of sources (such as their own investigations, models, and other stimuli such as diagrams or readings). 	<ul style="list-style-type: none"> • Differentiate between physical and chemical changes using written descriptions, pictures, and particle diagrams. • Make and justify a claim determining whether a substance, including molecules, is an element or compound (provided as written-out names, as chemical formulas, as models, and as diagrams/graphic representations).
Key Points: <i>What will students know today?</i>	
<ul style="list-style-type: none"> • A physical change is a change in matter that does not involve a change in chemical make-up / does not change or create a new substance. • A chemical change is a change in matter that causes it to change its chemical make-up / creates a new substance with new properties. • A molecule is a particle that is made up of two or more atoms bonded together / group of atoms bonded together. • A pure substance that cannot be broken down into another kind of matter through physical or chemical means. Elements are made of one type of atom. • A pure substance that can be broken down into two or more elements through chemical means / contains molecules with two or more different elements. 	
How	
<p><i>For all relevant resources, see the corresponding folder for this lesson in the YP Science 8 Teachers group on Schoology. Files that are included are designated with <u>underlining</u> and <i>italics</i>.</i></p> <ul style="list-style-type: none"> • Engage (Demo – 5 minutes): Take a piece of paper and rip the paper into a bunch of smaller pieces. Ask students to use the four signs of a chemical reaction to decide if the change in the paper represented a chemical reaction. Have one student make a claim about what they are seeing, and then have another provide evidence to their answer. As students share out, ask students "if it is not a chemical reaction, then what is it?" • Explore (OneNote – 5 minutes): State to students that physical and chemical changes can occur in matter. Using particle or atom-level diagrams can allow us to make predictions and develop an understanding of these changes. Using <u><i>the OneNote</i></u>, instruct students to analyze the particle diagrams for physical and chemical changes. Students will use three questions to make observations and analyze similar and differences. Pause 	

students after these three questions and have students share out observations. Then, instruct students to write individual definitions for physical and chemical change. Have 2-3 students share out their definitions.

- **Explain (OneNote – 10 minutes):** Give students one minute to read the definitions in the table on their OneNote and have them compare their own definitions. Ask students to reflect upon how the particle diagrams connect to the definition. Detail to students that chemical reactions cause chemical changes to clarify the difference. Use the two particle diagrams as a check for understanding questions.

Part Two – Elements and Compounds:

- **Explore (Demo or OneNote – 10 minutes):** Provide students with the different images of Legos to sort into two categories. If you have access to physical Legos have students do this at their table groups rather than on OneNote. Have students write a rule or sentence explanation. Many will either group molecules versus single atoms or one color versus multiple color. Explain to students what represents one atom. Ask them to predict what their groups may represent.
- **Explain (OneNote – 10 minutes):** Define the term molecule for students as a particle that is made up of two or more atoms bonded together / group of atoms bonded together. Then, explain to students their images also can represent two different types of substances, elements, and compounds. Then, use the table on their OneNote to explain the definition for element and compound as well as how each looks in words, particle diagrams, and symbols. Have students re-sort their Explore images into elements and compounds. Focus here on how molecules can be an element if all the atoms are the same and a compound if they are different. Finally, highlight for students that chemical formulas represent compounds and have multiple symbols from the periodic table. Model for students counting and identifying the symbols on the periodic table. Have students complete a check for understanding before releasing them to work independently. Have students turn and talk with their neighbor about, "what is the difference between an element and a compound?"
- **Elaborate (OneNote – 20 minutes):** Have students work on their OneNote independent practice and remind students to use the sentence stems on the top section of their synchronous notes. Cold call students to go over the answers.*
- **Evaluate (Schoology – 10 minutes):** Students will complete their exit ticket today on Schoology.

Other Notes

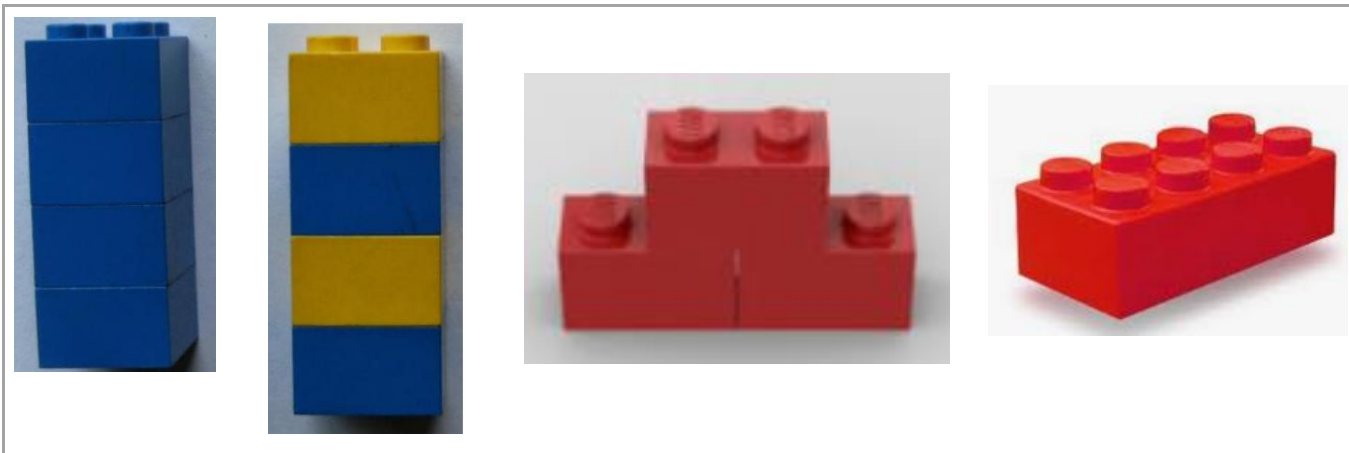
Student Facing Materials

OneNote:

Part Two - Elements and Compounds

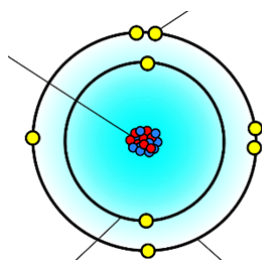
Sentence Stem Box	<ol style="list-style-type: none">1. This substance is an element because...2. This substance is a compound because...3. I observe that...4. In the diagram, I see ...5. I represented an element/compound by.....
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EXPLORE: Sort the images below into the two different categories.



What was the pattern you followed when sorting the Legos?

New Information: Atoms and Molecules!

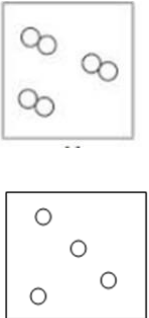
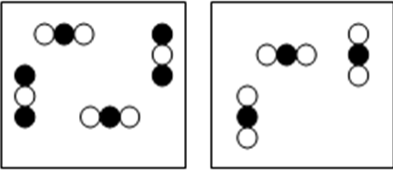


- A **molecule** is a particle that is made up of two or more atoms bonded together / group of atoms bonded together.

What is the difference between an atom and a molecule?

Elements vs. Compounds Key Points

	Elements	Vs	Compounds
Definition	<ul style="list-style-type: none"> • An element is a pure substance with one single type of atom. • Cannot be broken down into another kind of matter 		<ul style="list-style-type: none"> • A compound is a pure substance made of two or more different elements/types of atoms • Can be broken down into two or more elements through chemical mean

	through physical or chemical means.	
Example	<i>oxygen, carbon, helium, aluminum, gold, silver</i> (on the periodic table of elements)	<i>salt, water, carbon dioxide, glucose</i> (not on the periodic table of elements)
Picture		
Symbol	<i>O, C, He, Al, Au, Ag</i> <ul style="list-style-type: none"> • 1 capital letter and 2 letters maximum 	<i>NaCl, H2O, CO2, C6H12O6</i> <ul style="list-style-type: none"> • 2+ element symbols written together

- **A chemical formula** tells us what type of atom (element) and how many atoms are in a molecule
- The number of **capital letters** in a chemical formula tells us how many elements in that compound.

Teacher Model: $C_6H_{12}O_6$

How many elements are present?

Which elements are there?

Check for Understanding - Classify each chemical formula as an element or compound and explain why.

Formula	Element or Compound	Why?
CO ₂		
CH ₄		
Ne		
Ni		
SiO ₂		
H ₂		

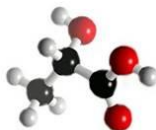
1. How many elements (types of atoms) are in H₂? List them.

2. How many elements (types of atoms) are in the compound NaHCO_3 ? List them.

3. Which element/type of atom is found in all of these compounds?

C_2H_6	NaHCO_3	$\text{C}_6\text{H}_{12}\text{O}_6$	CO_2	C_6H_6
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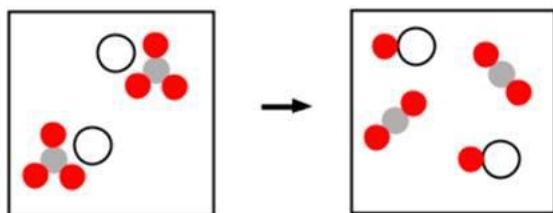
4. Does the following molecule represent an element or compound? Explain:



Directions

For each of the following examples, create a scientific argument including a claim, evidence, and reasoning to identify whether the following diagram or example represents a physical or chemical change.

1. Does the following diagram represent a chemical or physical change:

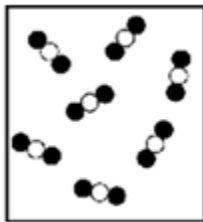
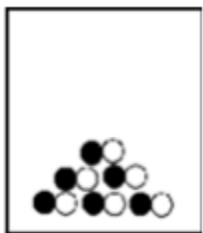




Classification

Chemical Formula	Element or Compound?	How did you know?	How many different types of atoms?
H ₂ O	Compound	I see two different capital letters which I know means there are two different chemical symbols. Chemical symbols represent the different elements.	2
Nickel			
Si			Skip
SiO ₂			
Au			
Sodium Bicarbonate			Skip
S			

Diagrams- Classify each diagram as an element or compound and explain why.

Diagram	Element or Compound?	Explanation
		
		



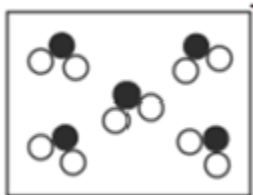
Part 2: C-E-R Practice

Tips to Writing a Successful Scientific Argument

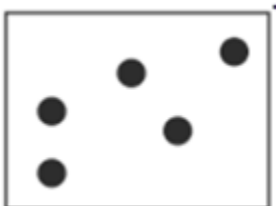
Reminders for writing a strong CER argument:

- State the claim(s) you are trying to support in a complete sentence.
- Include evidence.
- Provide reasoning that explains why the evidence supports your claim. One R per E!
 - Use vocabulary learned in class.
 - Use proper grammar, punctuation, and spelling.

Directions: Write a CER for all of the following examples about whether the image is of an element or compound.



Blank area for writing a CER for the first example.



Blank area for writing a CER for the second example.

