


# Three Dimensional Learning Plan: **HS-PS1-2**

Grade Level: **High School**






|   |  |                    |  |
|---|--|--------------------|--|
| Title   |  | Phenomenon/Problem |  |
| Designed by   |  | Course(s)          |  |
| Brief Learning Description  |  |                    |  |
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| Desired Results   |  |  |  |
|---|--|--|--|
| Performance Expectation(s)  |  |  |  |
| <b><u>HS-PS1-2: Simple Chemical Reactions</u></b><br>Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. |  |  |  |
| Previous Resources and Lessons Used for Instruction   |  |  |  |
| <a href="https://youtu.be/4LyArxwwifY">https://youtu.be/4LyArxwwifY</a>   |  |  |  |
| Summative Assessment  |  |  |  |
| Predicting Products - ( <a href="#">Google Template</a> )   |  |  |  |
| HS-PS1-2: <a href="#">Evidence Statement</a>  |  |  |  |
| What skills (practices) will students need to learn?  | What thinking concepts will students need to learn?                                    | What science concepts will students need to learn?   | What relevant or local phenomenon can be used to teach these concepts?                         |
| Use chemical symbols and notation to write and mass-balance molecular chemical equations  | Trends in electron affinity/electronegativity among the elements on the periodic table | Valence and orbital electron theory, oxidation and reduction, ion formation, chemical bonding, | Sodium metal in water produces hydrogen gas and heat, which ignites and explodes dramatically. |








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| Activity 1   |  |   |   |
|--|--|---|---|
| <br>Phenomenon<br>or Problem  | <br>What will they do?<br>The three dimensions woven<br>together into a single learning<br>performance. | <br>Why is this important?<br>How does this activity help<br>build understanding of the<br>anchoring phenomenon. | <br>How will they do it?<br>Graphic organizers, protocols,<br>scaffolds, labs, mini-lesson,<br>student discourse, etc. |
| Sodium into water LET'S GOOOOOO OOO  | Identify reactants and products, explain why the explosion happens   | The reaction proceeds due to the low electron affinity of the alkali metals and the instability of having a single valence electron. The  |   |
| <br>Formative Assessment<br>What information are you collecting to know that they met the target? |  |   |   |

| Activity 2   |  |   |   |
|--|--|---|---|
| <br>Phenomenon<br>or Problem  | <br>What will they do?<br>The three dimensions woven<br>together into a single learning<br>performance. | <br>Why is this important?<br>How does this activity help<br>build understanding of the<br>anchoring phenomenon. | <br>How will they do it?<br>Graphic organizers, protocols,<br>scaffolds, labs, mini-lesson,<br>student discourse, etc. |
| Magnesium, light 'um up! WHOOOOO!  |  |   |   |
| <br>Formative Assessment<br>What information are you collecting to know that they met the target? |  |   |   |

| Activity 3   |  |   |   |
|--|--|---|---|
| <br>Phenomenon<br>or Problem  | <br>What will they do?<br>The three dimensions woven<br>together into a single learning<br>performance. | <br>Why is this important?<br>How does this activity help<br>build understanding of the<br>anchoring phenomenon. | <br>How will they do it?<br>Graphic organizers, protocols,<br>scaffolds, labs, mini-lesson,<br>student discourse, etc. |
|  |  |   |   |
| <br>Formative Assessment<br>What information are you collecting to know that they met the target? |  |   |   |



| Activity 4   |  |   |   |
|--|--|---|---|
|  <p><b>Phenomenon or Problem</b></p>  |  <p><b>What will they do?</b><br/>The three dimensions woven together into a single learning performance.</p> |  <p><b>Why is this important?</b><br/>How does this activity help build understanding of the anchoring phenomenon.</p> |  <p><b>How will they do it?</b><br/>Graphic organizers, protocols, scaffolds, labs, mini-lesson, student discourse, etc.</p> |
|  |  |   |   |
|  <p><b>Formative Assessment</b><br/>What information are you collecting to know that they met the target?</p> |  |   |   |

| Activity 5   |  |   |   |
|--|--|---|---|
|  <p><b>Phenomenon or Problem</b></p>  |  <p><b>What will they do?</b><br/>The three dimensions woven together into a single learning performance.</p> |  <p><b>Why is this important?</b><br/>How does this activity help build understanding of the anchoring phenomenon.</p> |  <p><b>How will they do it?</b><br/>Graphic organizers, protocols, scaffolds, labs, mini-lesson, student discourse, etc.</p> |
|  |  |   |   |
|  <p><b>Formative Assessment</b><br/>What information are you collecting to know that they met the target?</p> |  |   |   |
|  <p><b>Summative Assessment</b><br/>What information are you collecting to know that they met the target?</p> |  |   |   |

## Materials / Resources

### **Vocabulary**

Chemical reaction (e.g. sodium and chloride, carbon and oxygen, carbon and hydrogen)  
Reactants and products  
Bonds (i.e. ionic, covalent)  
Reaction type (e.g. formation of ionic compound, combustion of hydrocarbons)  
Electronegativity  
Main group elements  
Valence electrons  
Periodic table  
Chemical properties  
Patterns

### **Mini-Lessons**

[Patterns Level 7 - Causal Patterns at Varying Scale](#)  
[Patterns Level 7 - Causal Patterns at Varying Scale Thinking Slides](#)

### **Graphic Organizers**

[Phenomena Observation Graphic Organizer](#)  
[Questioning Graphic Organizer](#)  
[Modeling Graphic Organizer](#)  
[Planning an Investigation Organizer - Experimental](#)  
[Planning an Investigation Organizer - Observational](#)  
[Investigation Evidence Organizer](#)  
[Engaging in Argumentation Organizer](#)

## Differentiation / Modifications



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