Curriculum Sample Template – 8 Pages Max. (12 pages for integrated ELA sample)

Grade Level	8th	**Content Area**	Science
Course Title (grades 9-12 Only)	NA		
Expected Prior Knowledge *List the knowledge/skills mastered earlier in the year that are foundational to the mastery of the Required Standard(s).*	Understand the concept of matter. Know that matter can be classified base on specific characteristics (i.e. states of matters). Safe practices in a laboratory setting (i.e. appropriate use of goggles, handling glassware carefully, etc.) Appropriate use of laboratory equipment (i.e. graduated cylinders).		
Alignment to Program of Instruction *Describe how the methods of instruction found in this sequence of lessons align to the Program of Instruction described in the application package.*	Pensar Academy utilizes a Blended Learning (BL) educational model that includes Direct Instruction (DI), Small Group Intervention, and Projects Based Learning (PBL) for students to achieve mastery of the Arizona College and Career Readiness Standards (ACCRS). Lessons are comprised of the 21st century skills of critical thinking, collaboration, communication, and creativity. Pensar Academy ensures that all students can reach mastery through the use of Universal Design for Learning (UDL) in the preparation of lessons that incorporate multiple learning styles, such as visual, auditory, tactile and kinesthetic. Pensar Academy's rotational model has embedded Response to Intervention (RTI) logistics to ensure that students who did not meet mastery are provided intervention immediately following the lesson to increase their understanding of the material. Students who are at the mastery level (a minimum of 80%) after the direct instruction will have the opportunity for enrichment through the use of Study Island and teacher constructed online learning activities. All students will apply learned content and skills learned through this rotational model in PBL extension periods. These components ensure that, at Pensar Academy, will students receive an individualized education comprised of 21st century skill building and optimal success in surpassing the ACCRS.		
Standard Number* and Description The standard number and description of the Required Standard(s) being instructed and assessed to mastery in the curriculum sample.	**8.S5.C1.PO2&PO.4** 8th Grade Strand 5-Physical Science Concept 1 - Properties and Changes of Properties in Matter PO2. Identify different kinds of matter based on the following chemical properties: • reactivity • pH • oxidation (corrosion) PO 4. Classify matter in terms of elements, compounds, or mixtures.		
Materials/Resources Needed *List all items the teacher and students will need for the entire sequence of instruction (excluding common consumables)*	Universal indicator, Calcium Chloride, Sodium Bicarbonate, Ziploc baggies, vials/medicine cups, safety googles, graduated cylinders – multiple sizes, measuring spoons, test tubes, test tubes racks, red cabbage, ammonia, vitamin C, Sodium Bicarbonate, vinegar, bleach, 7 Up, Milk of Magnesia, Epson Salt, Energy Drink,		

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Cluster, Standard (e.g., 6.EE.B.7). For HS Math, use Conceptual Category-Domain, Cluster, Standard (e.g., A-REI.C.6).*

<table>
<tr><th>Lesson
(add as needed)</th><th>Instructional Strategies - List and describe teacher actions, lesson by lesson, which will provide students with opportunities to engage the grade-level rigor defined by the Required Standard(s). Indicate alignment of instructional strategies to specific component(s) or content/skill(s) of the Required Standard/component.</th><th>Student Activities - Describe the activities, lesson by lesson, in which students will engage to allow them to master the grade-level rigor defined by the Required Standard(s). Indicate alignment of student activities to specific component(s) or content/skill(s) of the Required Standard/component.</th></tr>
<tr><td>1</td><td>Objective: Teacher will state the objective. Students will be able to (SWBAT) Classify matter as element, compound, or mixtures by differentiating according to its properties.
Anticipatory Set (AS): Get picture of objects representing matter. Ask students: How are these similar? How are these different?
Teacher Model/Inquiry: Teacher will discuss the properties of elements, compounds, and mixture through a computer base program presentation (i.e. Power Point, Notebook, etc.)
Guided Practice: Teacher will demonstrate the analysis required for the classification process by posing questions and answering them (i.e. does the substance made of one or more?). Three examples would be completed; one of each kind of matter – element, compound, and mixture.
Check for Understanding: Teacher will provide instruction for students to classify the three pictures – one for each category – individually. (1 minutes). Walk around to monitor students' progress. Direct students to discuss their rational for the classification with their face-partner. Teacher will provide feedback for students as needed – if students disagree and cannot come to an agreement as to the classification of the substance.
Independent Practice: Students will complete a practice activity in which they will analyze 10 different substances and complete the following table:
<table>
<tr><th>Substance</th><th>Observation</th><th>Classification</th><th>Reason</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>
Closure: Direct students to complete the Exit-ticket: Write an explanation of the concepts discussed in class to a classmate that was absent today.</td><td>Objective: Students will restate the learning objective… I will classify matter as element, compound, or mixtures by differentiating according to its properties.
Anticipatory Set (AS): Students will create a T-chart and write similarities and differences among the objects on the picture.
Teacher Model/Inquiry: Students will take notes using the anchor chart provided.
Guided Practice: Students will listen to the questions posed by the teacher and try to answer them as they follow along the teacher's thought process.
Check for Understanding: Students will classify the three pictures as element, compound, or mixture based on the information discussed (1 minute). When directed take turns with their face partner to discuss their thought process.
Independent Practice: Complete the independent practice.
Closure: Students will complete the Exit-ticket.
Small Group Re-teaching: Students who did not reach mastery – 8 out of 10 substances correctly classified - will attend a small group session with additional practice using a check list and flow chart to complete the classification.
Extensions: Students will complete pictorial representations for elements, compounds, and mixtures.</td></tr>
<tr><td>2</td><td>Objective: Teacher will state the objective. Students will be able to (SWBAT) Identify indicators of chemical reactions taking place.
Anticipatory Set (AS): Play the video Potassium Permanganate + Glycerin (https://www.youtube.com/watch?v=pq5hpN4ffvI). Pause the video at the 30 second mark and ask students to predict what will happen. Play video after students predicted. At the end of the video ask students to compare the results with their prediction. Ask: How do you know a chemical reaction took place?
Teacher Model/Inquiry: 1) Instruct students that a chemical reaction takes place when a substance reacting with another form a new product. 2) Discuss the directions and expectations for the Multiple Reaction Laboratory experience – below.
Guided Practice: Demonstrate the procedures for the students.
Check for Understanding: Ask questions pertinent to the procedure – i.e. how much Universal indicator are you using?</td><td>Objective: Students will restate the learning objective… I will identify indicators of chemical reactions taking place.
Anticipatory Set (AS): Watch the video, predict, and answer the questions presented by the teacher.
Teacher Model/Inquiry: Follow along as the teacher discusses the directions and expectations for the laboratory experience.
Guided Practice: Pay attention to the demonstration of the procedure and complete the appropriate steps as indicated by the teacher.
Check for Understanding: Answer the questions presented by the teacher.
Independent Practice: Follow the procedure as presented on the Multiple Reaction Laboratory and directed by the teacher and complete the laboratory report.
Closure: Share the identified indicators of a chemical reaction taking place.
Small Group Re-teaching: Students who did not reach mastery – correctly identifying 4 out of 5 indicators of chemical reaction - will attend a small group</td></tr>
</table>

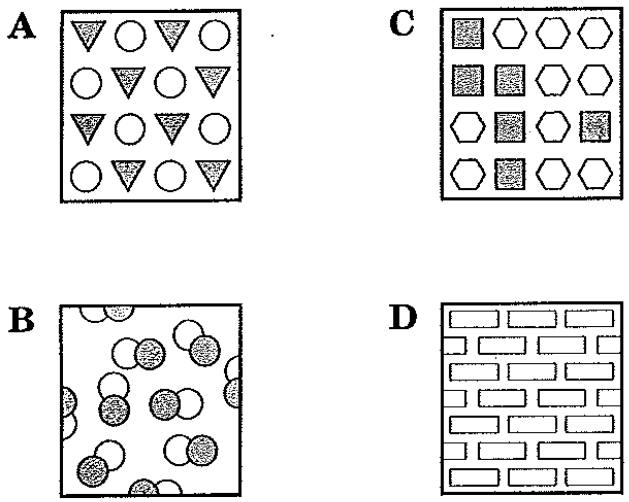
	Independent Practice: Monitor students' progress during the inquiry experience, check for appropriate safety procedure and use of equipment. **Closure:** Discuss the indicators of a chemical reaction taking place in the laboratory experience.	session for re-teaching involving videos of chemical reactions with a single indicator of the reaction. **Extensions:** Students will select one of the indicators of a chemical reaction and conduct further research on industrial processes in which such indicator of chemical reaction is present.
3	**Objective:** Teacher will state the objectives. Students will be able to (SWBAT) 1) Classify substances as acid or base. 2) Create a visual pH scale with the substances classified based on their relative strength. **Anticipatory Set (AS)**: Direct students to complete the K and W section of a K-W-L Chart about Acids and Bases. **Teacher Model/Inquiry:** 1) Teacher will discuss the properties of acids and bases through a computer base program presentation (i.e. Power Point, Notebook, etc.) 2) Discuss directions of the Acids and Bases Laboratory – see below. **Guided Practice:** Demonstrate the procedures for the laboratory experience. **Check for Understanding**: Ask questions pertinent to the procedure – i.e. what substance are you pouring into all test tubes? **Independent Practice:** Monitor students' progress during the inquiry experience, check for appropriate safety procedure and use of equipment. **Closure:** Direct students to complete the L section of the K-W-L Chart and discuss students' responses.	**Objective:** Students will restate the learning objective… I will classify substances as acid or base and create a pH scale based on the relative strength of those substances. **Anticipatory Set (AS)**: Complete the K and W sections of the K-W-L Chart. **Teacher Model/Inquiry:** 1) Take notes on the properties of acids and bases. 2) Follow along as the teacher discusses the directions for the Acids and Bases Laboratory. 3) Ask clarifying questions – if any – about the laboratory. **Guided Practice:** Listen and pay attention to the teacher demonstration of the procedure for the laboratory. **Check for Understanding**: Answer the questions presented by the teacher. **Independent Practice:** Follow the procedure as presented on the Acids and Bases Laboratory and directed by the teacher and complete the laboratory report. **Closure:** Complete the L section of the K-W-L Chart and share responses with the class. **Small Group Re-teaching:** Students who did not reach mastery – 8 out of 10 substances correctly classified as acid or base - will attend a small group session for re-teaching. **Extensions:** Students will write a laboratory experience similar to the one completed proposing a different indicator – not cabbage juice used in this lab.
4	**Objective:** Teacher will state the objectives. Students will be able to (SWBAT) 1) Explain the terms corrosion and oxidation as they relate to copper and the statue of liberty. **Anticipatory Set (AS)**: Have student read Saving Lady Liberty: Background information. (http://webcache.googleusercontent.com/search?q=cache:DOVQOAkzIz0J:www.kbs.msu.edu/images/stories/docs/K12/lessonplans/savingladyliberty-lessonplan.doc+&cd=18&hl=en&ct=clnk&gl=us) **Teacher Model/Inquiry:** Teacher will discuss the directions of the Saving Lady Liberty Experiment 1: Oxidation – follow the link above. **Guided Practice:** Demonstrate procedure steps that require modeling (i.e. step 2) **Check for Understanding**: Ask questions about the procedure (i.e. How often are you going to record observations about the appearance of the pennies?) **Independent Practice:** Direct students to start the inquiry and monitor students' progress during the inquiry experience, check for appropriate safety procedure and use of equipment. **Closure:** Direct students to complete predictions as to what the pennies will look like in 24, 48, 72, and 96 hours.	**Objective:** Students will be able to (SWBAT)… I will be able to identify indication of oxidation. **Anticipatory Set (AS)**: Read the Saving Lady Liberty: Background information. **Teacher Model/Inquiry:** Listen and pay attention to the teacher as s/he discusses the Laboratory directions. Ask clarifying questions – if any – about the laboratory. **Guided Practice:** Listen and pay attention to the teacher demonstration of the procedure for the laboratory and clarify by asking questions to the teacher. **Check for Understanding**: Answer the teacher's questions. **Independent Practice:** Follow the procedure as presented on the Saving Lady Liberty Experiment 1: Oxidation Laboratory and directed by the teacher and complete the laboratory report. **Closure:** Make predictions about the appearance of the pennies in 24, 48, 72, and 96 hours. **Small Group Re-teaching:** Students who do not demonstrate mastery will be assigned to small group instruction in which the teacher will guide the students through the inquiry process. **Extensions:** Students will complete a simulation of redox reaction taking place at the molecular level – showing the move of electrons. (http://www.chem.iastate.edu/group/Greenbowe/sections/projectfolder/flashfiles/redox/home.html)

S.A.	*Provide an opportunity for the student to complete the summative assessment items which is clearly separate from instruction and guided or independent practice, and in which the student is assessed independently. In the Student Activities column, provide a brief description of the summative assessment (S.A.) items that will allow students to demonstrate mastery of the rigor of the Required Standard(s)/components, and the context in which the items will be administered.*	The S.A. assesses mastery for identifying kinds of matter and classifying matter. Items 1-4, students will use the visual models to determine the mixture represented. Item #5, is multiple choice to assess PH levels. Item 6 is identifying between acid and bases through multiple choice. Item 7 is open response to state two bases with different Ph. Item 8 is multiple choice to identify an example of oxidation. S.A. is composed of eight questions; six multiple choices and two analysis questions that require the students to explain their reasoning. Summative Assessment Item #1-8 are a total of 10 points. Students need at least 8 out of 10 to achieve mastery.

Summative Assessment Items and Scoring: *Below, provide at least three Summative Assessment Items that together accurately measure student mastery of the application of the content and/or skills as defined by the grade-level rigor in the Required Standard(s). For each assessment item, provide an answer key or scoring rubric which clearly describes how assessment items are to be scored and how points will be awarded, such that mastery of the application of the content and/or skills as defined by the grade-level rigor in the Required Standard is clearly demonstrated by an acceptable score.*

Use the diagram below to answer questions 1-3. More than one letter can be used to answer the questions.

Summative Assessment Item 1 (clearly identify answer key/scoring rubric, and acceptable score):



1. Which of the diagram(s) represent a Compound? *Answer:***B (1 point)**

Summative Assessment Item 2 (clearly identify answer key/scoring rubric, and acceptable score):

2. Which of the diagram(s) represent an Element? *Answer:***D (1 point)**

Summative Assessment Item 3 (clearly identify answer key/scoring rubric, and acceptable score):

3. Which of the diagram(s) represent a mixtures? *Answer:***A & C (1 point)**

Summative Assessment Item 4 (clearly identify answer key/scoring rubric, and acceptable score):

4. How can you differentiate between compounds and elements? (**2 points on rubric below)**

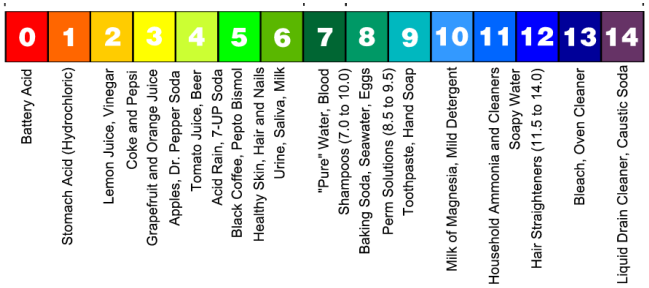
0 Points	1 Point	2 Points
None of the comparison aspects is discussed.	Answer includes one of comparison aspects identify on column for 2 points.	Answer includes: 1) compounds are chemically combined and 2) in a set ratio while mixtures

		are not chemically combined and do not have to have a specific ratio.

Summative Assessment Item 5 (clearly identify answer key/scoring rubric, and acceptable score):

5. Carrots have a pH of 5.0, so carrots are _____. *Answer:* **A (1 point)**
   A. acidic
   B. basic
   C. neutral
   D. an indicator

Use the diagram below to answer questions 6 and 7.



Summative Assessment Item 6 (clearly identify answer key/scoring rubric, and acceptable score): (1point)

6. Lemon and Grapefruit Juices are examples of:
   a. Acids
   b. Bases

Answer: **A**

Summative Assessment Item 7 (clearly identify answer key/scoring rubric, and acceptable score): (1 Point)

7. List two Bases with different pH and compare their strength. (2 points)
   *Answer:***1 point for identifying two bases (any substance with a pH >7) 1 point for the comparison of strength - the base with the higher pH number is the strongest base.**

8. Which of these is an example of oxidation? (1 point)
   a. A bake potato
   b. Rotting vegetables
   c. A rusting nail
   d. A peeled grapefruit

   Answer: **C**

<u>Appendix</u>

Multiple Reaction Lab

What: Students will…

- PRACTICE safety procedure applicable while conducting a Chemical Reaction/Change laboratory.
- IDENTIFY the evidence of Chemical Reactions/Changes during the lab.
- DEMONSTRATE appropriate use of laboratory equipment.

How: Students will…

- Complete the Multiple Reaction Lab following safety procedure and its corresponding laboratory report.

Pre-Lab questions:

1. List 3 safety procedures you need to follow during this lab and explain why are they important.
2. Observe and describe the reactants:
    a. $NaHCO_3$:_____
    b. CaCl:_____
    c. Universal Indicator:_____

Laboratory Procedure

1. Measure: 5 cubic centimeters (1 tsp) of NaHCO3 and pour it into the bag.
2. Add 10 cubic centimeters (2tsp) of CaCl into the same bag.
3. Measure 10 milliliters of Universal Indicator and pour it into the small vial.
4. Put the vial into the bag (**Keep it standing upright**) and carefully seal the bag.
5. Tip the vial of indicator solution in the sealed bag. **Make sure you are touching the bag**.

Analysis questions

1. Record at least 5 observations of evidence of a chemical reaction.
2. Open the bag while pointing it AWAY from your eyes. Waft – move the odor toward your nose using your hand. Was any odor produce? If yes, explain how does it smell and why you think that smell is produced.
3. How can you differentiate between the production of bubble in a chemical change and the production of bubbles in a physical change? Ex. Between the bubbling when you mix Baking Soda and Vinegar and the bubbling of boiling water.

Acid Base Lab

What: Students will…

- FURTHER their understanding of pH as a scale of Acids and Bases.
- CREATE a visual pH scale for the tested chemicals based on your understanding of acid and base indicators.

How: Students will…

- Complete the Acid and Bases Labs and its report.

Wear your goggles and tie back your hair!

1. Who are the other people in your group?
2. Prepare 10 test tubes. Mark then as A,B,C,D,E,F,G,H,I and J.
3. Pour about **5 mL** of acid-base indicator into each test tube. Tube "A" will act as your control. This is a neutral liquid.

Into each tube pour about **2 mL** of liquid to be tested:

A. Control *Leave it Alone*
B. Ammonia
C. Vitamin C
D. Sodium Bicarbonate
E. Vinegar
F. Bleach
G. 7 Up
H. Milk of Magnesia
I. Epson Salt
J. Energy Drink

4. Determine is whether each fluid is an acid or a base. Remember that with this indicator, acids will turn bright pink, and the bases will turn green with yellow being the strongest base. The color of "A" is neutral. Place a piece of white paper behind the tubes to get the truest color reading.

Arrange your tubes with the strongest acid on the left, and the strongest base on the right

5. Verify that the arrangement is accurate using the Litmus paper provided.
6. Draw, color and label your test tube rack. Your labels must include:
   A. The letter of the tube
   B. The name of the substance
   C. Whether it is an acid, a base, or a neutral.

   *** You **MUST** do your color drawing on the reverse of this paper.
7. Clean up. Wash and dry the test tube, re-rack and return them. Dry any surfaces you got wet.