21st Century Themes/Skills:

DCI (Disciplinary Core Ideas)	Science and Engineering Practices	Cross Cutting Concepts	Student Learning Objectives	Differentiated Activities (Consider the 5 Es)	Resources/Technology	Formative Assessments	Benchmark Assessment
PS1.A: Structure and Properties of Matter • Different properties are suited to different purposes. (2-PS1-3) (2-PS1-3) • A great variety of objects can be built up from a small set of pieces. (2-PS1-3) PS1.B: Chemical Reactions • Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. (2-PS1-4	Analyzing and Interpreting Data Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1) Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (2-PS1-3) Engaging in Argument from Evidence - Construct an argument vith evidence to support a claim. (2-PS1-4)	Cause and Effect - Events have causes that generate observable patterns. (2- PS1-4) Energy and Matter - Objects may break into smaller pieces and be put together into larger pieces, or change shapes. (2- PS1-3)	SWBAT: Observe and describe how matter can change in size, mass, color, position, quantity, time, temperature, sound, and movement by breaking objects into smaller pieces and/or building new objects SWBAT: Observe and describe how temperature can change the physical properties of some materials by heating or cooling a substance	ENGAGE: Activate Prior Knowledge Ask students if they have ever folded a piece of paper to make a paper airplane, glider, or a paper hat. Ask if they have ever rolled up a piece of paper (to make a type of bullhorn) and talked through it to make their voice louder. Ask if they have ever cut up paper to make confetti. Then, with a sheet of paper, demonstrate folding it to make confetti. Then, with a sheet of paper, demonstrate folding it to make confetti. Then, with a sheet of paper, demonstrate folding it to make confetti. Then, with a sheet of paper and the something. Ask: Is the paper still paper even after you just described. Ask students to describe how you have changed the shape of paper to make something. Ask: Is the paper still paper even after you made something out of it? Encourage students to tell how they know that the paper is still paper after being manipulated in different ways. Ask if they think any of the changes you made can be measured. Next, ask students to think about ways in which temperature might change a material. Encourage students to think about cooking or baking and have them share their ideas. Provide each student with a piece of paper. (If possible, use paper from the recycling bin to avoid unnecessary waste.) Invite them to make something out of it by cutting, folding, or rolling the paper. Ask: How has the paper changed? How is it the same? Encourage students to fold or scrunch their piece of paper into any shape the visih. Then, have volunteers describe the way in which your paper is different from the flat piece of paper you started with? How can you describe the way in which your paper is different from the flat piece of paper you started with? Tell students that size, shape, and color are physical properties. Say: Physical properties describe how any have already learned about the physical properties dematerials and some ways physical properties can be changed. Show students the video Physical Changes (show through mixtures; stop video before discussion of solutions at 2:4). A	Unit 3 Resources	Have students complete the Constructed Response (CR) items titled Primary Assessment: Changes in Matter.	

21st Century Themes/Skills:

DCI (Disciplinary Core Ideas)	Science and Engineering Practices	Cross Cutting Concepts	Student Learning Objectives	Differentiated Activities (Consider the 5 Es)	Resources/Technology	Formative Assessments	Benchmark Assessment
				EXPLORE 1: Present students with the Lesson Questions and have them complete the first section of the Scientific Explanation: Changes in Matter using these questions. Students may type their responses directly into the digital	Video Segment: Physical Changes		
				resource, or they may write or draw their responses on a printed copy of the resource. The digital resource includes a link to a PDF version of the Student Sheet.			
				Guide students to think about what they already know about each question and record their prior knowledge in the Prior Knowledge section. Encourage students to think about and record how they know whet the net do conceptence ad are compared as a student of the section.			
				Introduce the Evidence section, explaining to students that they will fill this in as they go through the rest of the lesson. Have students begin the Evidence section with information gathered			
				during Engage. EXPLORE 2: Remind Students of the physical changes they observed in the Engage.			
				Have them read (or read aloud as a class) the Core Interactive Text section How Can I Tell If Matter Has Changed? What Are Some of the Ways That You Can Change Materials?			
				Have students read the passage Melting Ice. Tell them to look tor what heat does to ice and what ice does to liquid. Have students complete the Hands-On Activity: Forms of Water. Write the following used bulkers used on the heard or short noner liquid.			
				solid, temperature. Review the following definitions and encourage students to view the animations in the Interactive Glossary to solidify their understanding:			
				A solid is a material that keeps a fixed shape. A liquid is a material that flows or changes shape based on the container that it is in.			
				Temperature is how hot or cold an object is. EXPLORE 3: Review the ways in which changes in temperature change water and other substances			
				Show students the video segment Discovery Science Alliance: Investigating Heat Changes. Ask students the following questions to confirm their understanding:			
				Why is the water in the fish bowl decreasing over time? (evaporation due to heat from the Sun) What investigation helps the children learn about this question? (placing			
				water and crayons under a heat lamp) What does the heat lamp represent? (the Sun) What evidence that heat changes matter did the children in the video observe? (lower writer lawle melter derware)			
				What conclusion did the people in the video draw about what caused the changes to the water and to the crayons? (They concluded that heat changed the state of the water to a gas and the solid crayons to a liquid.)			
				Introduce the Hands-On Lab: Heating and Cooling by discussing physical changes. Ask: What are some examples of physical changes? Create an anchor chart with the student examples of physical change.			
				Ask students to complete a think-pair-share. Read the following question aloud: Can these changes be reversed? Discuss chemical changes by defining a chemical change as a change in which the material changes into a the mutatement. The individual			
				which the materials change into other substances. The individual substances cannot be easily changed back to what they were before. Give examples such as burning a log, noting that ashes cannot be changed back into the log. We know a chemical change occurs when a different			
				substance forms. Let students know that mater is not actually created; it just changes forms. We can also use clues to show that a chemical change has happened.			
				Write the following on an anchor chart and give examples of each: change in color odor presence of light heat Refer to the Procedure on the Teacher Guide for the Hands-On Lab for additional instructions. Use the Answire and Consultations constraints are			
				discussion questions, use the Analysis and Conclusions questions as discussion questions after groups have completed the lab. Have groups discuss the questions, and then share their ideas in a class discussion. Display the following statement and read it aloud. Some changes caused			
				by heating or cooling can be reversed and some cannot. Have groups discuss the Hands-On Activity and the Hands-On Lab, and list evidence from those activities that supports the statement.			
				Have a spokesperson form each group read aloud the evidence the group compiled. Make a master list of evidence on the board, and have volunteers summarize the strongest evidence using the list.			

21st Century Themes/Skills:

DCI (Disciplinary Core Ideas)	Science and Engineering Practices	Cross Cutting Concepts	Student Learning Objectives	Differentiated Activities (Consider the 5 Es)	Resources/Technology	Formative Assessments	Benchmark Assessment
				EXPLAIN 1: Have students use the evidence that they collected in the Explore sessions to complete the sections of the Scientific Explanation: Changes in Matter titled 'Claim' and 'Explanation.' Students may type their responses directly into the digital resource, or they may write or draw their responses on a printed copy of the resource. The digital resource includes a link to a PDF version of the Student Sheet. Have groups of 2-4 students share their explanations with each other. Students should then revise or enhance their explanations based on group discussion. EXPLAIN 2: Review the first half of the video segment Two Chemical Experiments (to 2:25) with students. Ask them to turn to a partner and explain the investigation that was modeled with vinegar and baking soda. Tell students that today they will conduct the investigation. Discuss why scientists replicate experiments. Conduct the Hands-On Activity: Changes in Matter with students. Before beginning, discuss aftey procedures they should take. Specifically, explain that safety goggles are important in this lesson to protect their eyes from splashes that may occur when measuring, pouring, and mixing the baking soda and vinegar. Model the proper usage of safety goggles including tightening the strap. Point out the safety checklist in the student activity sheet and remind students to review it before beginning the activity. After the activity, have students discuss whether they think the change they observed can be reversed or cannot be reversed. Have them give	Video Segment: Two Chemical. Experiments		
				reasons for their answers FLADORATE 1: Show students a fresh egg and have them describe it. Encourage them to describe the parts of an egg (shell, yolk, white). Then, break the eggshell and empty the contents into a bowl. Ask students to describe what they see and to determine how the physical properties of the egg have changed. Ask: How dit the egg change? (The shell was cracked and the insides came out. The egg no longer has its egg shape.) Beat together the egg yolk still have all the vitamins they had when they were inside the shell? (Yes.) Encourage students to discuss why, even though many of its properties are still the same, the egg can no longer return to its original form. You may encourage students to orecite the nursery rhyme about Humpty- Dumpty and then use what they have learned to explain why he could not be put together again. Be sure to be aware of students who may be allergic to eggs so that they avoid contact. Discuss what happens to an egg when you increase its temperature by heating or cooking it. Ask students to tell if an egg can go back to being uncooked once it is cooked. We the video segment Baking the Cake and the Big Escape to discuss changes in matter. Luse the Lesson Questions to discuss how temperature is involved in baking and how a baked item is different in a measurable way from the dong no batter it is made from—such as having a greater volume. Have students to describe the changes in the herbs and to explain why the herbs changed their appearance. (The air dried out the water that was in the fresh herbs.) Direct attention to the sentence "By winter, the herbs are different." Ask: What evidence can you find in the passage to support this statement? (Students should point to the descriptions of the herbs hefore and after they were dired.) Encourage students to discuss what would happen if the dried herbs were dipped in water. Ask: Would they become fresh gain? Why not? Invite students to suggest other foods that change when they are dried. ELABORATE 2: 	Baking the Cake and the Big Escape		

21st century 1nemes/skills:								
DCI (Disciplinary Core Ideas)	Science and Engineering Practices	Cross Cutting Concepts	Student Learning Objectives	Differentiated Activities (Consider the 5 Es)	Resources/Technology	Formative Assessments	Benchmark Assessment	
						-		
							1	
					1			
					-			