

Lesson Plan

Learning Segment Focus: Solubility of different materials

Lesson: 3 of 3

Course & topic addressed: Structure and Properties of Matter Date: 10/3/2020

Grade:5

Student Outcomes

Specific learning objectives for this lesson.	By the end of this lesson students should be able to answer the quiz given the tables and the graphs with at least 90 percent accuracy.
Justify how learning tasks are appropriate using examples of students' prior academic learning .	Students will use their previous knowledge of matter and properties of different materials to understand how different materials can dissolve at different rates.
Justify how learning tasks are appropriate using examples of students' personal, cultural, linguistic, or community assets .	In my class there are two students who are English learners, three students who are IEP/504. With the diversity of students in mind, I will allow for accommodations, modifications, and differential instructions. I will use Excel (spreadsheets) to tabulate and graph results which will allow visual display of the results and facilitate learning. The class will be divided into small groups for better hands on experience.

State Academic Content Standards

List the state academic content standards with which this lesson is aligned. Include abbreviation, number & text of the standard(s).	<p>PS1.A: Structure and Properties of Matter.</p> <p>5-PS1-1 Develop a model to describe that matter is made of particles too small to be seen.</p> <p>5-PS1-2 Measure and graph quantities to provide evidence.</p> <p>5-PS1-3 Make observations and measurements to identify materials based on their properties.</p> <p>5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances</p>
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Key Vocabulary

What vocabulary terms/content specific terminology must be addressed for students to master the content?	Solubility Solute Dissolve Room temperature Solvent Particles Matter
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Academic Language Support

<p>What are the Academic Language Function(s) (the content and language focus of the learning task represented by the active verbs within the learning objectives/outcomes) and explain how they are utilized in the lesson plan?</p> <p>What planned Academic Language Supports will you use to assist students in their understanding of key academic language to express and develop their content learning and to</p>	<p>Students will answer the quiz at the end of the lesson. The class will be divided into three groups. Each group will do the experiment but with a solute at a different temperature. I will do scaffolding by demonstrating to the class how the experiment is done and I will guide them by passing around and giving differentiated</p>
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<p>provide varying supports for students at different levels of Academic Language development? How do these supports address all three Academic Language Demands (vocabulary, syntax, and discourse)?</p>	<p>instruction. Each group will put the results in a table in Excel and make specific graphs to visualize the results. There will be a poster on the wall that they could use to help them remember the difference between solvent and solute. Each student will discuss what he or she learned today with the student sitting next to them. There will be a small quiz the students will answer using the graphs they made, and at the end of the class they will write a summary of what they have learned in their journals.</p>
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Materials

<p>Materials needed by teacher for this lesson. (such as books, writing materials, computers, models, colored paper, etc.)</p>	<p>Computer, Excel Software, projector, wall poster, quiz sheets, permanent markers, plastic cups, measuring cups, measuring spoon, stop watch, salt, sugar, baking powder, water, vinegar, tea, apple juice, lemonade (These should be enough for the students to do all three experiments).</p>
<p>Materials needed by students for this lesson. (computers, journals, textbook, etc.)</p>	<p>Computer, Excel Software, Pencil, Journals.</p>

Lesson Timeline with Instructional Strategies & Learning Tasks

Amount of Time	Teaching & Learning Activities (This should be a BULLETED LIST)	Describe what YOU (teacher) will be doing and/or what STUDENTS will be doing during this part of the lesson. (This should be VERY DETAILED)
<p>5 Minutes</p>	<p><u>Introduction:</u></p>	<p>Good afternoon class, in the past two lessons we have been learning about matter and the properties of matter.</p> <p>Today we will do an experiment so we can learn more about the solubility of materials at different temperatures and how it can be used to identify the material. We will be mixing two or more substances together to see the end results.</p> <p>This will help us in the future to understand more about chemical and physical reactions of different substances.</p> <p>.</p>

Amount of Time	Teaching & Learning Activities (This should be a BULLETED LIST)	Describe what YOU (teacher) will be doing and/or what STUDENTS will be doing during this part of the lesson. (This should be VERY DETAILED)
30 minutes	<u>Instruction:</u>	<p>We will divide the whole class into three groups. Each group will do the same experiments but at different temperatures. Each group will use the spreadsheets on Excel to record the results in a table such as the one here on the projector. I have done this one for you as an example.</p> <p>Now, we have three different solutes: salt, sugar and baking powder. We have 5 different solvents: water, vinegar, tea, apple juice, and lemonade. Group 1 has the solvents at room temperature, group 2 has the solvents at a higher temperature after heating the solutes for 10 minutes, and group 3 has cold solutes after they have been in the fridge for 45 minutes.</p> <p>I will demonstrate the steps you need to do. First take a plastic cup and write on it water/sugar. Always remember to label your cups, so that you know what is its contents. Now, take your measuring spoons and place one teaspoon of sugar in the cup just like that. Bring your measuring cup and measure 8 ounces of water (240 ml). Show me thumbs up if you are following along.</p> <p>Now, one student will hold the stop watch and another one will pour the water onto the sugar in the plastic cup. Record the time needed for the sugar to dissolve. Write that time in the spreadsheet. Repeat these steps with the different solvents and then do the same thing with each solute. Remember to record your results in the spreadsheet. Any questions?</p> <p>Now, we have completed all three tables. I want each group to display the results</p>

Amount of Time	Teaching & Learning Activities (This should be a BULLETED LIST)	Describe what YOU (teacher) will be doing and/or what STUDENTS will be doing during this part of the lesson. (This should be VERY DETAILED)
		<p>in three different graphs. Follow along as I will show you how on the projector. By looking at the graphs, you could see that at colder temperatures we needed more time for all the solutes to dissolve and less time was needed at warmer temperature. We can also note that different solutes dissolved at different rate. Note here, that sugar was much faster to dissolve than salt. We can use that to differentiate between sugar and salt. Also note that since the sugar dissolved we can no longer see it, but we know it is there. Right? This proves that particles can be too small to be seen. When we added sugar to water, how do you think the water will now taste? When we added salt, how will the water taste? So mixing substances can result in a different product.</p> <p>Please go back to your seats and discuss with your neighbor what you have learned today.</p> <p>I want you to use the graphs we did to help you answer the quiz. When you are done please turn the quiz in and write a summary of what you have learned today in your journals.</p>
10 minutes	<u>Closure:</u>	<p>We have done an experiment and learned more about the properties of matter and about different substances and how they have different properties</p> <p>This will help us in the future to</p> <p>Now please clean your desk, get your lunch bags and coats, and get ready to go home. Please sit quietly at your desk and wait till they call for car riders and bus riders.</p>

Accommodations/Modifications

How might I modify instruction for: <i>Remediation?</i>	
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<p><i>Intervention?</i> <i>IEP/504?</i> <i>LEP/ESL?</i> (All students who have plans mandated by federal and state law.)</p>	<p>I will use Excel (spreadsheets) to tabulate and graph results which will allow visual display of the results and facilitate learning.</p> <p>I will allow the ESL students to use a dictionary while doing any assignment, and pre teach key words.</p> <p>I will send home a study guide, and allow extended time for the IEP/504 students. I will also do close monitoring.</p> <p>I will give one student preferential seating to allow him to focus more on his work.</p>
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Differentiation

<p>How might you provide a variety of techniques (enhanced scaffolding, explicit instruction, contextualized materials, highlighters/color coding, etc.) to ensure all student needs are met? (All students who are not on specific plans mandated by federal and state law.)</p>	<p>I will use Excel (spreadsheets) to tabulate and graph results which will allow visual display of the results and facilitate learning.</p> <p>I will use smaller groups for differentiated instructions for those that need more help.</p> <p>I will read the quiz out loud in order to help struggling readers.</p> <p>I will use color coding when needed.</p>
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Assessments: Formative and/or Summative

<p>Describe the tools/procedures that will be used in this lesson to monitor students' learning of the lesson objective(s) (include type of assessment & what is assessed).</p>	<p><input checked="" type="checkbox"/>Formative/<input type="checkbox"/>Summative</p>	<p>Show thumbs up if they understand</p>
	<p><input checked="" type="checkbox"/>Formative/<input type="checkbox"/>Summative</p>	<p>Raise their hands if there are any questions</p>
	<p><input type="checkbox"/>Formative/<input checked="" type="checkbox"/>summative</p>	<p>Checking the results in the spreadsheets and the quiz they turned in.</p>

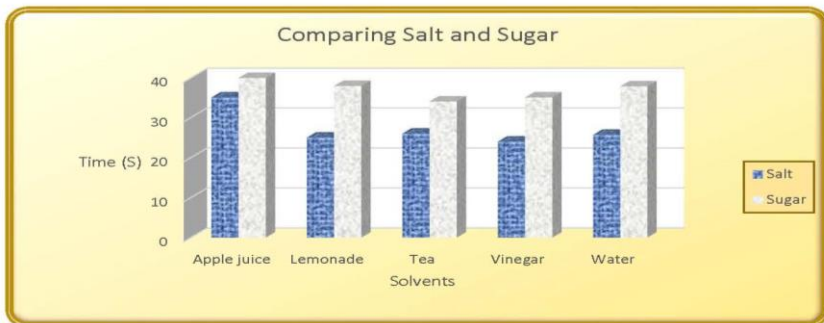
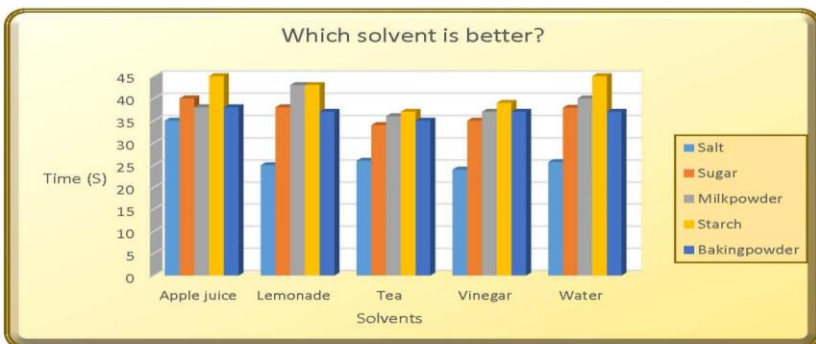
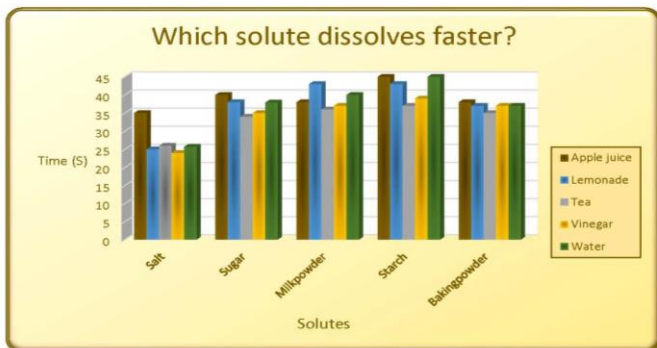
Research/Theory

<p>Explain connections to theories and/or research (as well as experts in the field or national organization positions) that support the approach you chose and justify your choices using principles of the connected theories and/or research.</p>	<p>Non-linguistic representation was used in the spreadsheets to summarize the results because it follows Marzano's instructional strategies. Scaffolding was used because it follows Vygotsky's social-interaction theory and the zone of proximal development.</p>
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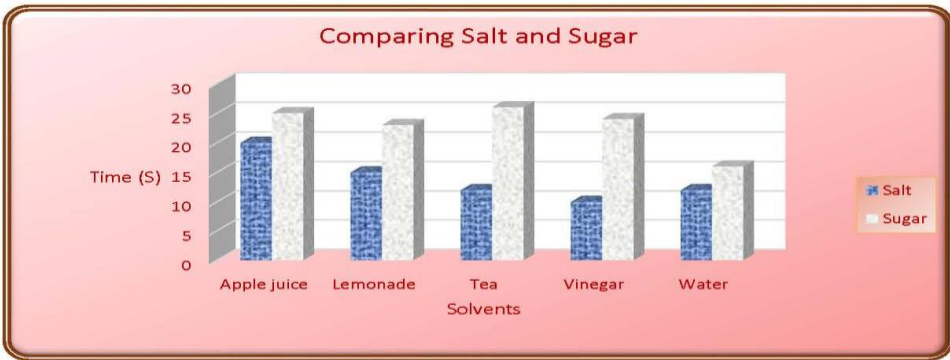
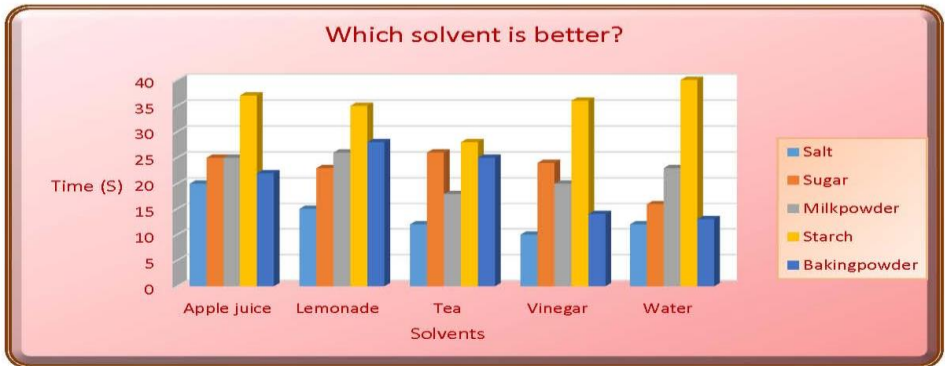
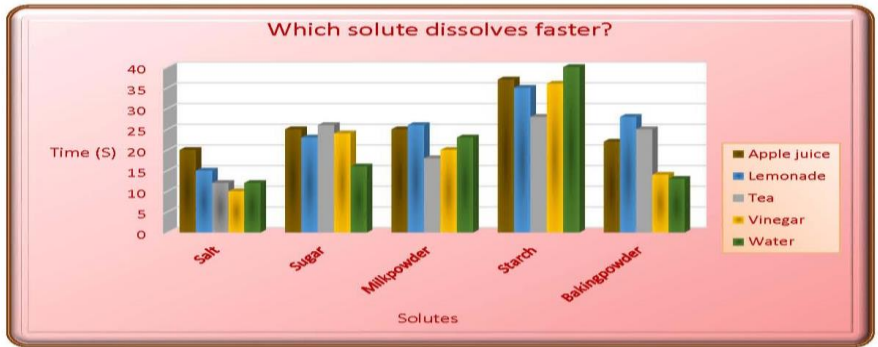
Lesson Reflection/Evaluation

<p>What went well? What changes should be made? How will I use assessment data for next steps?</p>	<p><i>TO BE FILLED IN AFTER TEACHING</i></p>
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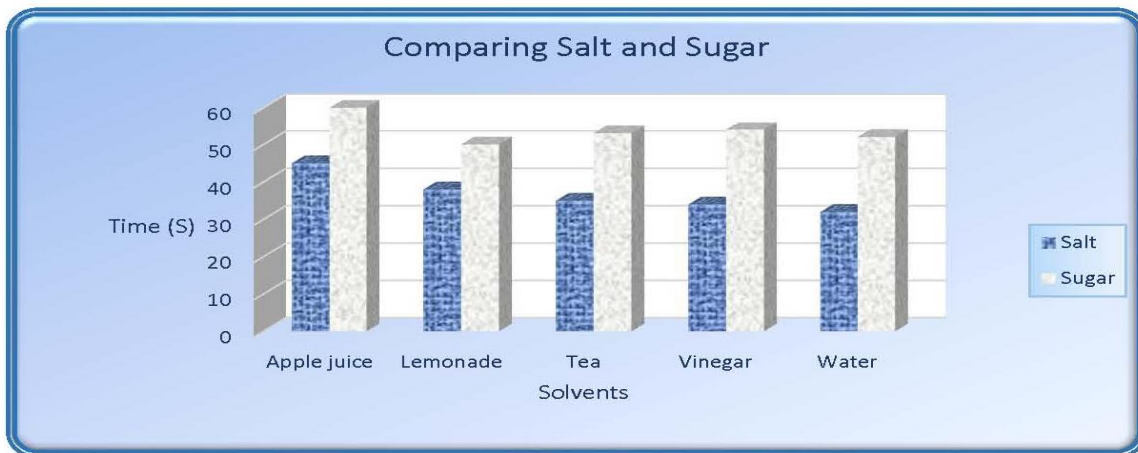
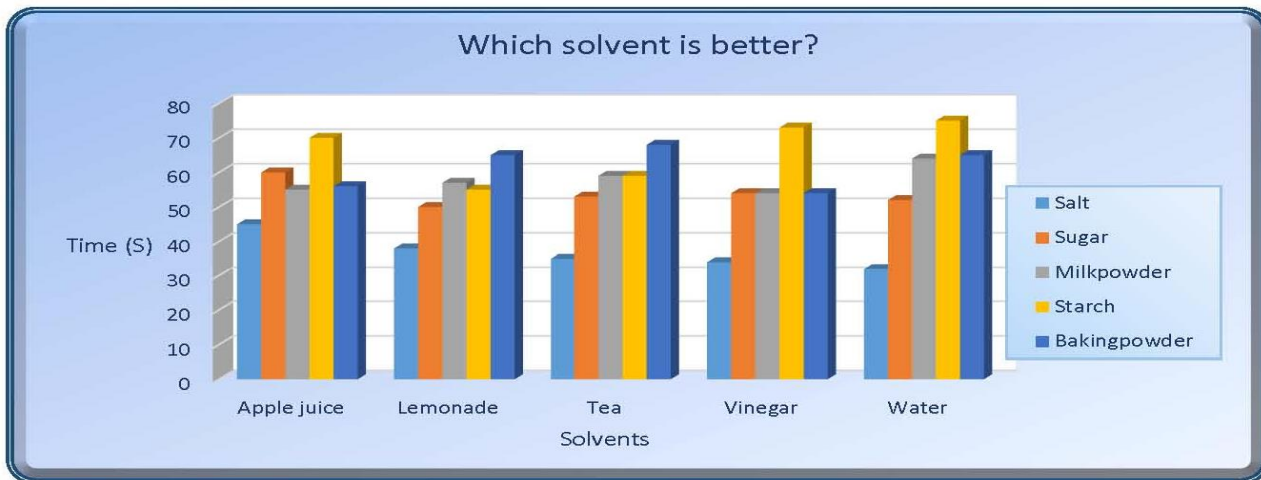
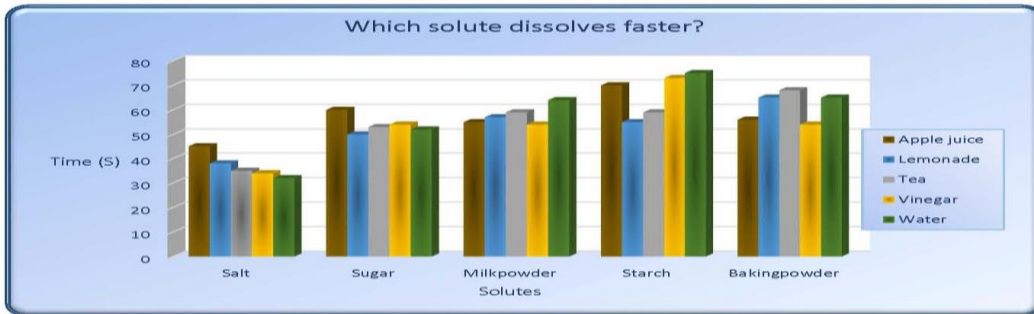
Solubility at Room Temperature							
	Salt	Sugar	Milkpowder	Starch	Bakingpowder	Sum	Average
Apple juice	35	40	38	45	38	196	39.2
Lemonade	25	38	43	43	37	186	37.2
Tea	26	34	36	37	35	168	33.6
Vinegar	24	35	37	39	37	172	34.4
Water	26	38	40	45	37	186	37.1
Sum	136	185	194	209	184	908	181.5
Average	27.1	37.0	38.8	41.8	36.8	181.5	36.3



Solubility at Warmer Temperature							
	Salt	Sugar	Milkpowder	Starch	Bakingpowder	Sum	Average
Apple juice	20	25	25	37	22	129	25.8
Lemonade	15	23	26	35	28	127	25.4
Tea	12	26	18	28	25	109	21.8
Vinegar	10	24	20	36	14	104	20.8
Water	12	16	23	40	13	104	20.8
Sum	69	114	112	176	102	573	114.6
Average	13.8	22.8	22.4	35.2	20.4	114.6	22.9



Solubility at Cooler Temperature							
	Salt	Sugar	Milkpowder	Starch	Bakingpowder	Sum	Average
Apple juice	45	60	55	70	56	286	57.2
Lemonade	38	50	57	55	65	265	53.0
Tea	35	53	59	59	68	274	54.8
Vinegar	34	54	54	73	54	269	53.8
Water	32	52	64	75	65	288	57.6
Sum	184	269	289	332	308	1382	276.4
Average	36.8	53.8	57.8	66.4	61.6	276.4	55.3



Comparison						
	Salt	Sugar	Milk Powder	Starch	Baking Powder	Average
Room Temperature	27.1	37.0	38.8	41.8	36.8	36.3
Warmer Temperature	13.8	22.8	22.4	35.2	20.4	22.9
Cooler Temperature	36.8	53.8	57.8	66.4	61.6	55.3
Average	25.9	37.9	39.7	47.8	39.6	38.2

