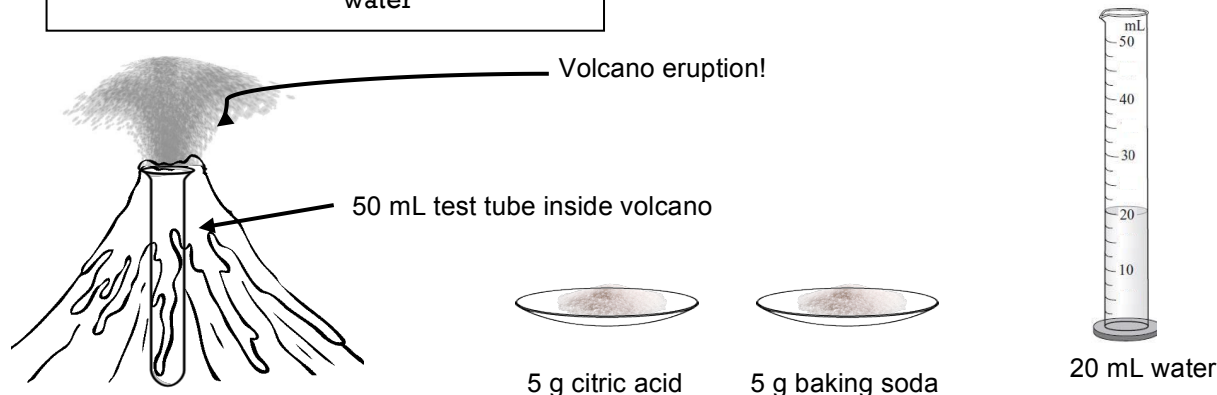


Making a Bigger Volcano Eruption

A student had the task of creating a demonstration for a second grade class. She decided to make a volcano using the equipment and chemical substances in her laboratory. In her laboratory she found the following materials:

Chemical Substances	
acetic acid	isopropyl alcohol
acetone	sodium bicarbonate
aluminum foil pieces	sodium carbonate
benzoic acid	sodium chloride
citric acid	sodium hydroxide
hydrochloric acid	sucrose
	water

Equipment	
Scale	Beakers
Hotplate	Clamps
Test tubes	Ring stand
Volumetric flask	Red cardboard
Graduated cylinders	Watch glasses

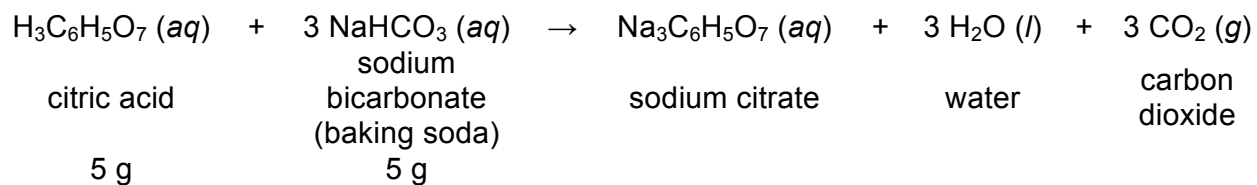


The student made a volcano shape. She used a 50 mL test tube as the inside of the volcano. Then she placed 5 g of citric acid and 5 g of sodium bicarbonate (baking soda) into the test tube. Afterward, she poured 20 mL of water into the test tube. The ingredients fizzed and looked like a volcano erupting.

What are **three** different things she could do to make a bigger eruption? Explain or justify why your changes would make the eruption bigger.

Chemical Thinking Learning Progression Project
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The chemical reaction that occurs from the materials she chose is:



Given this information, what further ideas do you have on things that the student could change to make the volcano eruption bigger? Explain or justify why your changes would make the eruption bigger.