

STEM in the lab

.....● Inspiring Idaho's future STEM workforce

KOOL-AID CHEMICAL REACTIONS



GRADE LEVELS

This activity is appropriate for students in grades 6-9 to complete on their own. Students K-5 will need an adult's help for this reaction.



VOCABULARY

CHEMICAL REACTION: where one or more substances, are converted to one or more new substances.

REACTANTS: the substance that takes part of a chemical reaction.

PRODUCTS: what is produced in a chemical reaction.



MISSION

How do you know when a chemical reaction has occurred? This experiment will help you learn the indicators of a chemical reaction.



MATERIALS

- » Lemon juice
- » Vinegar (any type)
- » Kool-Aid packet
- » Water
- » Baking soda
- » 3 cups
- » Food coloring (optional)
- » Trays

DIRECTIONS

CAUTION! This can get messy. Use a tray to contain the mess or do this experiment outside if possible.

- 1 In the first cup, dissolve the Kool-aid packet in $\frac{1}{2}$ cup (or approximately 120 mL) of water. Set on tray.
- 2 In the second cup, add $\frac{1}{2}$ cup (or approximately 120 mL) of lemon juice. Set on tray.
- 3 In the third cup, add $\frac{1}{2}$ cup (or approximately 120 mL) of vinegar, add a couple of drops of food coloring if you like. Set on tray.
- 4 Predict what will happen to each liquid when you add the baking soda.

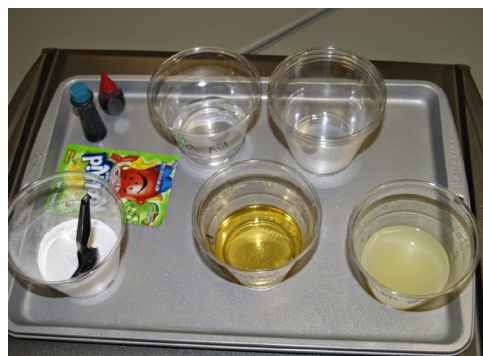


Photo credit: Lynda Williams from teachingscience.us

Liquids	Predictions	Predictions	Predictions
Kool-Aid & Water			
Vinegar			
Lemon Juice			

5 Add 1 tsp baking soda (or approximately 5.6 grams) to each liquid.

6 Describe the reaction:

Liquids	Predictions	Predictions	Predictions
Kool-Aid & Water			
Vinegar			
Lemon Juice			

QUESTIONS

1. Did a chemical reaction occur? How do you know?
2. Do you think changing the temperature of the water in the Kool-Aid would influence the reaction?
3. Is cooking a chemical reaction? How do you know if it is?

FURTHER EXPLORATIONS

- » Try testing the reaction with baking soda and different liquids such as other fruit juices, soda, or milk. Will these react the same?
- » Substitute half of an antacid tablet for the baking soda. How this affect the reaction?
- » Compare different types or brands of powdered drink mixes.
- » Watch [this video](#) to learn more about acids and bases.
- » Watch [this video](#) to learn about more chemical reactions.
- » Watch [this video](#) to learn about some important chemical reactions.

THE SCIENCE BEHIND IT

Kool-Aid and lemon juice contain citric acid which is an acid that chemically reacts when mixed with a base, such as baking soda. This is the same reaction that occurs when vinegar is mixed with baking soda to make a baking soda volcano!

REFERENCES

- » Williams, L. (2021, August 2). Fun experiment with Kool-Aid chemical reactions. Teaching Science with Lynda R. Williams. <https://teachingscience.us/fun-experiment-with-kool-aid-chemical-reactions/>.

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