



IMPORTANT:

Read all directions before proceeding

Kool-Aid Experiment

OVERVIEW: This program introduces the Scientific Method of experimentation to students. The exercise allows all students to experiment with Kool-Aid/sugar/water mixtures and draw conclusions from their research concerning the ideal sugar to Kool-Aid ratio

OBJECTIVE: This experiment is designed to give the students the opportunity to practice the SCIENTIFIC METHOD as a member of a team

GRADE LEVEL: 2-5

STATE STANDARDS:

SCIENCE INQUIRY AND APPLICATION

During the years of PreK-4 all students must become proficient in the use of the following scientific processes, with appropriate laboratory safety techniques to construct their knowledge and understanding in all science content areas:

- *Observe and ask questions about the natural environment
- *Plan and conduct simple investigations
- *Employ simple equipment and tools to gather data and extend the senses
- *Use appropriate mathematics with data to construct reasonable explanations
- *Communicate about observations, investigations, and explanations
- *Review and ask questions about the observations and explanations of others

TIME: 40 minutes

VOCABULARY: scientific method, hypothesis, experiment, observation, conclusion, solution, teamwork, variable, control

MATERIALS: Per group of 3-4 students

- 4 mixing cups—1 for each solution
- 1 envelope unsweetened Kool-Aid mix poured into a cup or other suitable container
- Approx. 1/2 Cup sugar in a container
- 1/2 cup measuring cup
- 1/8 tsp. measuring spoon
- 1 stirring stick
- 1 container of water
- 1 sample cup per student

GETTING READY:

1. Arrange/group student desks in groups of 4-6.
2. Empty Kool-Aid envelopes into containers for groups.
3. Put sugar into group containers.
4. Arrange materials by groups.

DEVELOPED BY: Tim Dixon, Chemical Engineer, BP Lima Chemicals

PROCEDURE:

STEP ONE: HYPOTHESIS

Work as a team. Each group should estimate the amount of Kool-Aid mix and sugar needed to make 4 ounces of water into a great tasting drink.

The recipe should be expressed in the form of a ratio. Example: 10 measuring spoons and 2 measuring spoons of Kool-Aid powder gives a ratio of 10:2 (ten-to-two). Your estimate may be based on experience or may be an educated guess.

STEP TWO: EXPERIMENT

The group will formulate up to 4 solutions, one at a time. The first will be that of the initial hypothesis. Subsequent solutions will be made from the revised recipe developed from results of previous solutions.

Record the amount of sugar and powdered drink mix to be added to the water.

Using the measuring cup, measure out 4 oz. (1/2-Cup) of water and pour into mixing cup. Using the measuring spoon, measure out the appropriate amount of sugar and add to the water. Also measure the Kool-Aid and add to the water. Use the stirring spoon, stir the mixture until dissolved. DO NOT get your measuring spoon wet.

STEP THREE: OBSERVATION

Pour a small amount of the solution into each group member's cup. Each member should taste the drink and note observations. Does it taste too sweet? Too sour? Too weak? Too strong? Too_____? Just right? Write down your observations.

STEP FOUR: CONCLUSION

After each taste test, the group must decide if the last drink was satisfactory. If not, the group must decide how to adjust the recipe. Should we add less or more sugar? More or less Kool-Aid powder? How much more or less?

Come up with a new recipe for your next experiment and write it down. If this was the fourth solution, write down your final recipe. This can either be the recipe used to make your last drink or a modification of it. If this was not your fourth try, repeat steps 2 through 4.

SUGGESTIONS: Emphasize the scientific method and encourage the use of the terminology.

VARIATIONS:

Control all variables except sugar. I.e. Each trial will consist of 4 oz. of water and 1/8 tsp. of Kool Aid. Students can alter the amount of sugar added to each trial.

Rather than ounces, water could be measured in milliliters. Older students could use beakers to measure the water.

As students clean up, follow up with a discussion proper disposal of hazardous materials used.

KOOL-AID EXPERIMENT DATA SHEET

INITIAL RECIPE

INITIAL HYPOTHESIS/RECIPE:

Water: 4oz.	Observations:
Sugar: _____scoops	_____
Kool-Aid: _____scoops	_____

EXPERIMENT

EXPERIMENTAL RESULTS:

Water: 4oz.	Observations:
Sugar: _____scoops	_____
Kool-Aid: _____scoops	_____

OBSERVATIONS

Water: 4oz.	Observations:
Sugar: _____scoops	_____
Kool-Aid: _____scoops	_____

CONCLUSIONS

Water: 4oz.	Observations:
Sugar: _____scoops	_____
Kool-Aid: _____scoops	_____

REPEAT 1x, 2x, 3x

FINAL RESULTS

FINAL RECIPE

Water: 4oz.	Observations:
Sugar: _____scoops	_____
Kool-Aid: _____scoops	_____

MODIFIED RECIPE