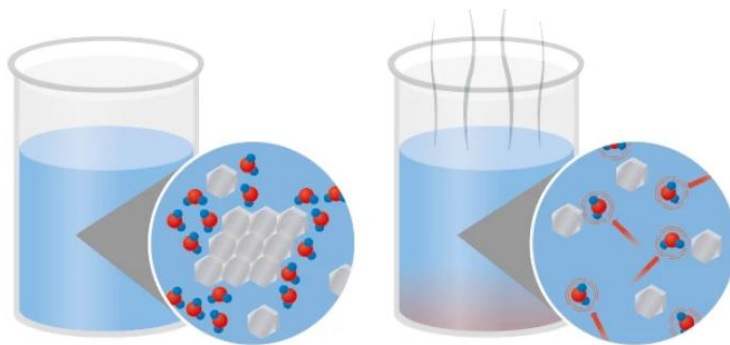


# Solubility Lab Activity – Student Edition

## Kool-Aid Solubility Curve

### Background Information:

A solubility curve plots the solubility of a substance at different temperatures. This activity shows you how the temperature of the solvent affects the amount of solute that can be dissolved. When a substance dissolves, the attractive forces between the solid and liquid particles cause the solute to be dispersed throughout the solvent.



Substance dissolving in cold water

Substance dissolving in hot water

### Specific Learning Objectives

By the end of this lab activity you should be able to:

- Describe dissolving.
- Name the components of a solution.
- Define solubility and describe how the temperature affects it.

### Safety Precautions

- Do not drink the used Kool-Aid at the end of the activity, due to possible contamination from lab equipment.
- Limit hot water temperature to 50°C to prevent serious burns in the event of scalding.

# Solubility Lab Activity – Student Edition

## Pre-Lab Questions:

In this experiment you will be making a saturated solution of Kool-Aid.

1. Define the term saturated solution.

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2. Define the terms soluble and insoluble.

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3. Identify the solute in this experiment

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4. Identify the solvent in this experiment

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5. Write a hypothesis/prediction for this experiment about how changing the temperature of the water will affect the solubility of the solute.

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## Lab set up

Time allowance: 50 minutes

Equipment needed (per 3 students):

- Kool-Aid
- 2 x 100mL beakers
- Measuring cylinder
- Electronic balance
- Plastic Petri dish
- Spatula
- Stirring rod
- Thermometer
- Hot and cold-water source.

# Solubility Lab Activity – Student Edition

## Lab Instructions:

1. Ensure all equipment is clean and dry.
2. Measure 100ml of cold water with a measuring cylinder and transfer it to a beaker.



3. Measure the temperature of water with the thermometer and record this value in the results table.



4. Use the electronic balance and tare the Petri dish before weighing out 5g of Kool-Aid into the plastic Petri dish.



5. Transfer the Kool-Aid to the beaker of cold water



# Solubility Lab Activity – Student Edition

6. Stir the solution until the Kool-Aid has dissolved.



- 7. Continue to measure and then add Kool-Aid to the beaker of cold water in 5g increments until no more can be dissolved. Record the final mass of Kool-Aid in the table.
- 8. Repeat the activity with 4 other temperatures by mixing hot and cold water in a beaker to achieve each temperature and then measuring out the 100ml volume.

### Observations and Notes from Activity:

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### Results Table:

Temperature of Water (°C)	Total Mass of Kool-Aid Dissolved (g)

# Solubility Lab Activity – Student Edition

## Post-Lab Questions:

1. Draw a graph to show the solubility of Kool-Aid at different temperatures of water.



2. Describe the relationship between solubility and temperature.

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3. Describe what is happening on a particle-level as the Kool-Aid dissolves.

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4. What effect would decreasing the amount of water used have on the solubility of Kool-Aid?

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