

# KIDS FIRST CHEMISTRY SET



THAMES & KOSMOS



**WARNING.** Not suitable for children under 8 years. For use under adult supervision. Read the instructions before use, follow them and keep them for reference.

**WARNING** — Chemistry Set. This set contains chemicals and/or parts that may be harmful if misused. Read cautions on individual containers and in manual carefully. Not to be used by children except under adult supervision.



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**TIP!**  
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**EXPERIMENTS**

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 Dive into the fascinating world of crystals by making your own sugar and salt crystals.

**Color Lab: Mixing, Separating, and Dissolving ..... 18**  
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**Acid Lab: Acidic, Alkaline, or Neutral..... 26**  
 What exactly is acid, where can you find it, and what can you do with it? All these questions are answered in this chapter.

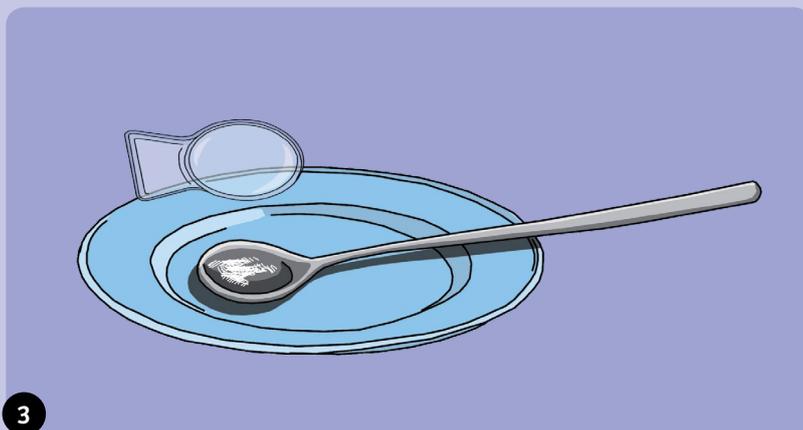
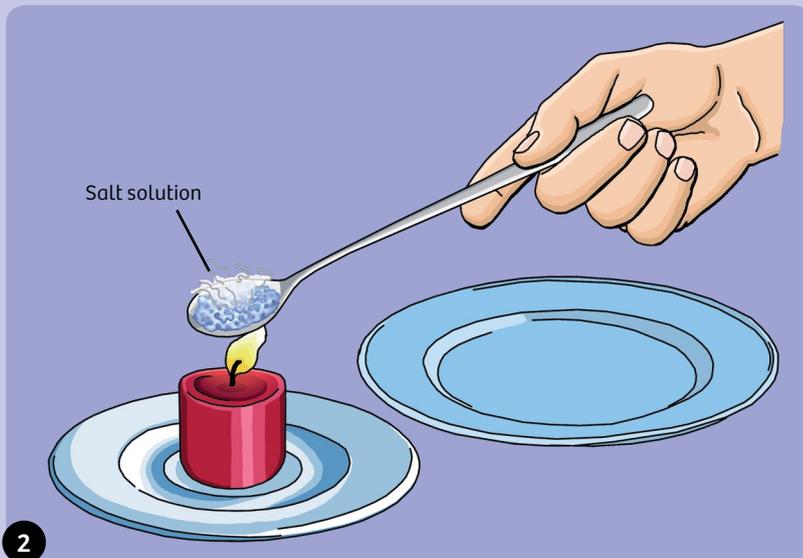
**Gas Lab: Where Things Bubble and Hiss ..... 38**  
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**Analytic Lab: Identifying Substances ..... 46**  
 How do chemists distinguish similar-looking substances from one another? Learn about chemical analysis in this chapter.





## EXPERIMENT 2



# Evaporating the salt and sugar solutions

## YOU WILL NEED

- > Magnifying lens (note safety information on p. 13),
- > Salt and sugar solutions from Experiment 1
- > Old ice cream spoon or tablespoon made of metal
- > Tealight candle, old saucer
- > Plate
- > Lighter or matches

## HERE'S HOW

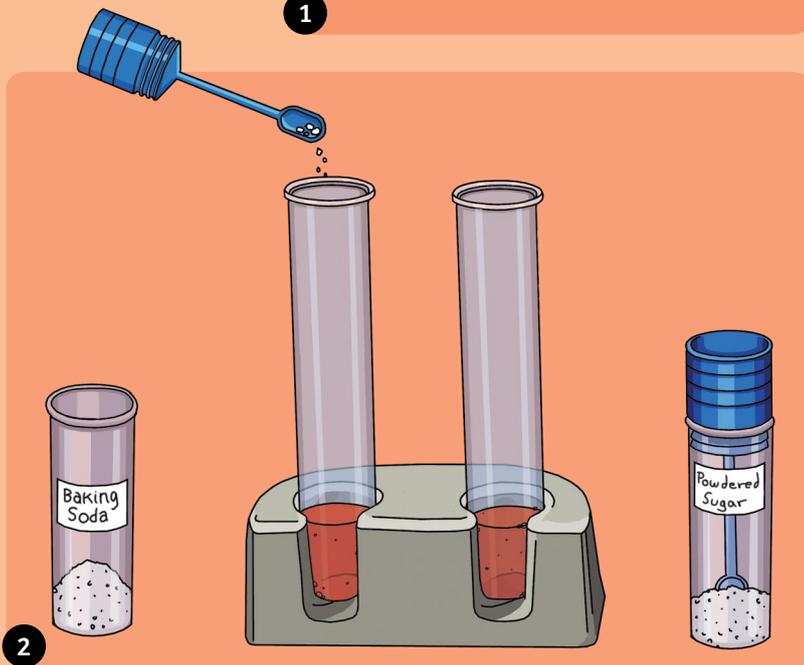
1. Perform this experiment with the help of an adult. Set the tealight candle on the saucer, and have the adult light it.
2. Hold the long metal spoon filled with salt solution just over the flame. This will let you carefully evaporate the salt water from the spoon. A long spoon is necessary so the handle doesn't get too hot.
3. Set the hot spoon on the plate and blow out the candle. Examine the result under the magnifying lens. What happens when you evaporate sugar water? Try it! Just be careful, because the sugar solution might spit.

## WHAT'S HAPPENING?

When you evaporate the salt solution over the candle flame it leaves behind a white coating in the spoon, because the salt quickly crystallizes out. With the sugar, on the other hand, things look different. You gradually get a brown caramel coloration. Eventually, the sugar mass will even carbonize and burn.



## EXPERIMENT 13



## What is the opposite of sour?

You can use the “opponents” of acids to reverse the color changes. To a chemist, these “opponents” are known as bases or alkalis, a category that also includes baking ingredients such as baking soda. You will experiment with those now.

### YOU WILL NEED

- > Test tube stand
- > 2 Test tubes with the red cabbage juice from Experiment 12
- > 2 Vials with built-in spoons
- > Self-adhesive labels
- > Powdered sugar and baking soda (sodium bicarbonate), pen

### HERE'S HOW

1. Fill one vial with baking soda and one with powdered sugar, and label them.
2. Add a spoonful (using the spoon built into the lid of the vial) of baking soda to the first test tube from the previous experiment (the one containing the red cabbage juice with a few drops of lemon juice). Shake the test tube a little. Careful: it might foam up. Watch carefully to see what happens.
3. Also add a spoonful of baking soda to the other test tube from the previous experiment (the one containing the red cabbage juice with a few drops of vinegar), and watch what happens.
4. Clean one of the test tubes, and add a little more red cabbage juice to it acidified with a little lemon juice or vinegar. Add a spoonful of powdered sugar.
5. Compare and note your observations. The table to the left will help you get a quick overview.

| Added                          | a lot of acid | a little acid | water   | powdered sugar | baking soda      |
|--------------------------------|---------------|---------------|---------|----------------|------------------|
| Color of the red cabbage juice |               |               |         |                |                  |
|                                | acidic        |               | neutral |                | alkaline (basic) |

## WHAT'S HAPPENING?

When you add one of acid's opponents, such as baking soda (sodium bicarbonate), red cabbage juice turns blue. These substances are called “bases” or “alkalis” by chemists. The opposite of acidic is basic or alkaline. But there are also substances like powdered sugar that look almost identical to baking soda, yet they do not cause a change in the color of the indicator. These substances are called “neutral.”