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SCIENCE 2 GO

Explore your world with this Science-to-Go backpack

KITCHEN SCIENCE

Grades 3-5

Books in this backpack

- Exploring Kitchen Science: 30+ Edible Experiments and Kitchen Activities
  by The Exploratorium
- Food: 25 Amazing Projects Investigate the History and Science of What We Eat
  by Kathleen M. Reilly
- Kitchen Science Lab for Kids: 52 Family-Friendly Experiments from Around the House
  by Liz Lee Heinecke
- Many Kinds of Matter: A Look at Solids, Liquids, and Gases
  by Jennifer Boothroyd
- Science Experiments with Food
  by Alex Kuskowski

More books at your library

Food Waste. Deborah Chancellor. J363.7288
Grow It, Cook It. DK Publishing. J635
Melting, Freezing, and Boiling Science Projects with Matter. Robert Gardner. J507.8
They Ate What?! The Weird History of Food. Richard Platt. J641.3009

Local Connection

Put the **South Sound Regional Science Fair** on your calendar. Hosted in March by Pacific Lutheran University, the event is open to all Pierce County residents. Create your own project, or just look and be inspired by local K-12 students.

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Information & Imagination

ACTIVITY

Hot Ice

You're welcome to keep this sheet!

Using a couple of kitchen ingredients and a little bit of patience, you can create the molecule used in most hot packs: sodium acetate. Create this super-saturated liquid and activate it to instantly create crystal formations with an exothermic (heat) reaction.

What you need:

- 4 cups of clear vinegar
- 4 tablespoons baking soda
- Medium sauce pan
- Jar or Tupperware
- Stove top
- Refrigerator

Try this:

1. Put 4 cups of vinegar into a medium-sized sauce pan. Then slowly add 4 tablespoons of baking soda; pause and stir every half tablespoon to allow the fizzing reaction to slow down. (If you add this too fast, you'll have a saucepan volcano!)
2. You've just made sodium acetate ($C_2H_3NaO_2$). But it's too dilute (watery). On the stove, using medium low heat, bring your solution to a boil to get rid of the water.
3. Your solution is ready when crystals start to form around the sides on the top layer. This should take 1-2 hours and there will be less than ¼ the liquid you started with. You may want to save one of the crystals to activate your solution later. You don't want any crystals in your final solution, so add an additional tablespoon of vinegar and stir until all crystals are dissolved.
4. Pour it into a jar or Tupperware with a lid to prevent further evaporation. Put the covered solution in an ice bath for an hour or in the refrigerator for 2 or more hours.
5. Carefully remove the solution. You can pour the solution into another pan to create a hot ice sculpture, introduce the crystal you kept or knock the jar with a spoon.
6. Observe the crystals forming! The liquid was cold before—touch the side of the jar or gently touch a crystal. Is it cold now?

The sodium acetate molecules were in a liquid form because there wasn't a seed crystal or enough initial energy to create the stable crystal structure. As soon as you introduced a little extra energy by pouring or knocking, those molecules realized they could join to one another and become more stable as solid crystals.

Going Further

In the field notebook, write what went well or if anything went wrong with your Hot Ice experiment—or share an experiment you did from one of the books in this backpack.