

by jok church

YOU CAN

MyQuestion@beakman.com

with **beakman & jax**

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Dear Beakman,

What makes ice crack when you pour a liquid on it, even if the liquid is cold?

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Questions, name & address

Experiment #1

WHAT YOU NEED:
Plastic soda bottle
- water - freezer

WHAT TO DO:
Fill the bottle all the way to the very edge of its rim. Place it in your freezer without a cap and wait overnight. The next

morning you'll see ice poking up out the top.

WHAT IS GOING ON:
Take a look at our drawings. The molecules in liquid water can bunch up any which way. But ice is a crystal – a regular arrangement of

P.S., from Jax: You get clear ice when the temperature is even throughout the whole cube. Ice machines do that by freezing water as it flows and mixes to even out the temperatures.

Dear Justin,

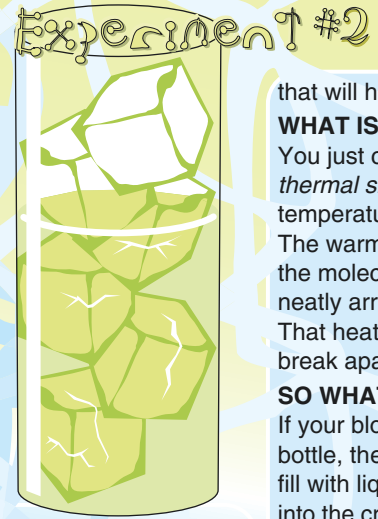
There are so many things going on with ice cubes that people disagree about. Like, how can you make clear ice cubes? And whether or not hot water freezes quicker than cold water. (It does not.) Different people say different things and say so a lot, which means ice cubes are *controversial* (con-tro-VUR-shal). But so many other things are controversial these days. How ice cracks probably will be, too.

Beakman
Beakman Place

the molecules – and their pattern takes up more room, so ice gets bigger as it freezes.

This expansion is powerful stuff. It can even crack apart concrete roads when the water in them freezes.

HOLD THAT THOUGHT:
When you cover ice cubes with a liquid, water expanding is a part of ice cracking. But just a part of it.



that will happen.

WHAT IS GOING ON:
You just created something called *thermal shock* – a rapid change in temperature. The warm water injected energy into the molecules of water that were neatly arranged in a rigid pattern. That heat energy was enough to break apart the crystal's pattern.

SO WHAT:
If your block of ice had not been in a bottle, the cracks that opened would fill with liquid water that would flow into the cracks. Then it would freeze. As it froze, the water would expand and widen, pushing open the original crack, cracking it more and more. So ice cracking has a couple of things going on. It's more than one simple process. And aren't most things that are controversial?

