

by jok church

myQuestion@beakman.com

BEAKMAN JAX  
YouTube: salt water freezing animation

Dear Jax,  
Salt sprinkled on ice cubes melts the ice. When I sprinkle salt on frozen salt water, it still melts. Why is that?  
Dilu Chunu  
Kerala, India

Dear Dilu,  
Salt melts frozen water because the salt gets in the way of water molecules forming the shape ice needs to be. Water is H<sub>2</sub>O. Our top drawing shows how liquid water behaves. Frozen water, or crystalline water, behaves like our lower drawing. That's the shape ice needs to be. It's how water molecules can hook on to each other to be a solid.

Salt is a molecule of sodium and chlorine. When dissolved in water, parts of a salt molecule get in the way of water arranging itself into the crystal shape that hard, solid ice needs to be. If it isn't in that shape, it's liquid, or melted ice.

# : STUFF TO DO :

Dissolve as much salt as you can in very hot water. Ask a grown-up to microwave some water in a Pyrex® measuring cup. Keep adding salt and stirring until no more salt will dissolve.

When the water cools, put some in a small bowl and put it into your freezer. It probably will not freeze solid – unless your freezer reaches down to -5.8° F or -21° C.

That's the temperature at which salt will no longer get in the way of liquid water forming into its crystalline shape.

Actually, most everything you can dissolve in water will get in the way of ice crystals forming. Salt is used to de-ice roads in the winter mostly because it's cheap and there is lots of it around.

Alcohol or epsom salt dissolved in water will also lower the freezing temperature of the water.

