THE SCIENCE BEHIND *Ice Cream in a Bag*

Making Ice Cream in a Bag

Check out our free pdf called *Everyone Scream for Ice Cream* for directions on how to make your own ice cream at home! All you need is milk, sugar, vanilla, ice, water, rock salt (NaCl), and two resealable bags (1 qt and 1 gal).

What's going on?

Ice cream is a frozen (solid) foam consisting of air mixed in a solution of sugar, protein, and fat in water. The protein and fat molecules dispersed in the milk are very large particles and thus form a colloidal mixture rather than a true solution.

Since ice cream will not form at 0 °C, a temperature of –10 °C or lower is necessary. In this activity, you are making a salt-ice water mixture that freezes at about –15 °C. This mixture, then cools a smaller, sealed bag with the delicious ice cream ingredients.

The salt (sodium chloride) lowers the temperature of the ice water. This is called freezing point depression. The salt-ice water mixture then also cools your ingredients which allows the ice cream to form!

INTERESTING FACTS ABOUT **ICE CREAM**

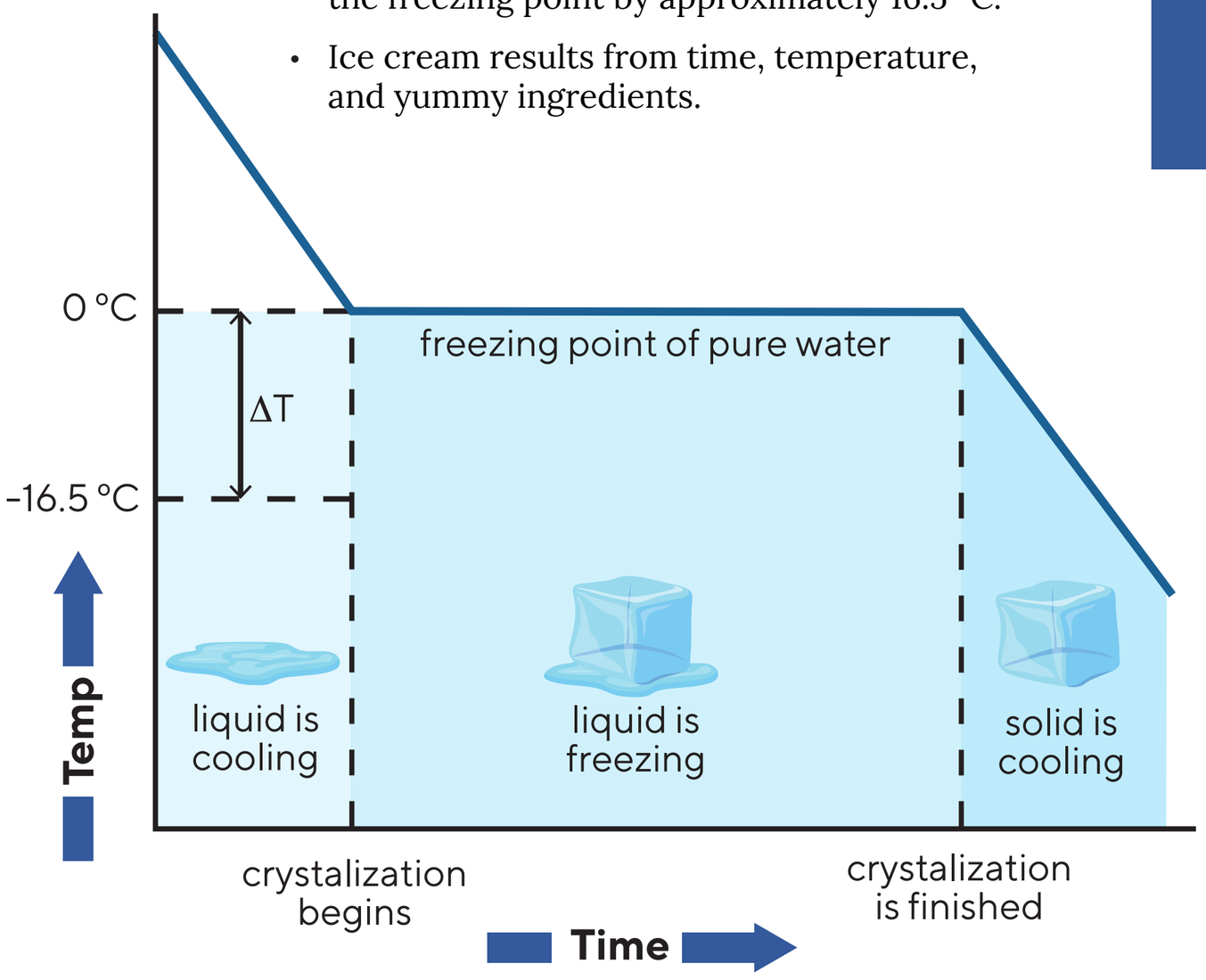
1 Approximately 1.6 billion gallons of ice cream are consumed per year in the United States of America.

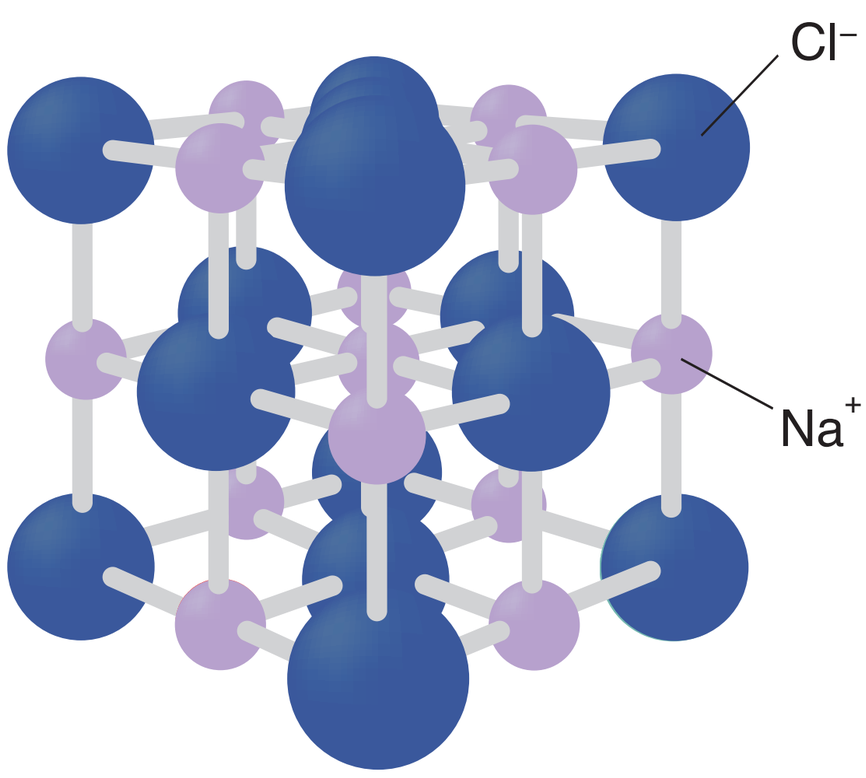
2 Edible ice cream "cups" or "cones" started becoming mainstream at the beginning of the 20th century. Various waffle irons and molds were used to make the cups and cones.

3 The tallest ice cream cone ever made was in Norway in 2015. The delightful treat holds the Guinness world record at a little over ten feet high. It consisted of a cone, chocolate, ice cream, and jam.

Freezing Point Depression

- A 20% sodium chloride solution decreases the freezing point by approximately 16.5 °C.
- Ice cream results from time, temperature, and yummy ingredients.





Sodium chloride