What Juices Are Needed

For this activity, the students will be mixing juices to make a new liquid to melt ice. Below are tips for juices to purchase:

- When buying the juice, the most important factor is the amount of sugar per fluid ounce of juice. This is important because the sugar is what will melt the ice. The more sugar there is in the juice, the faster the ice will melt.

- When buying juice, make sure that one of the juices you purchase is double the amount of sugar than the other juices. For example, apple juice will have about 26g of sugar and then the cranberry will have about 7g of sugar per fluid ounce. It is important that there is a significant difference in the amount of sugar between the juices. (Tip – choosing one diet drink will help limit the sugar.)

- You can mix the juices in different amounts for this experiment if you only have two different kinds of juice. For example, you could do 1 cup of apple juice, 1 cup of cranberry juice, and the third cup can be made of 1/2 apple and 1/2 cranberry juice.

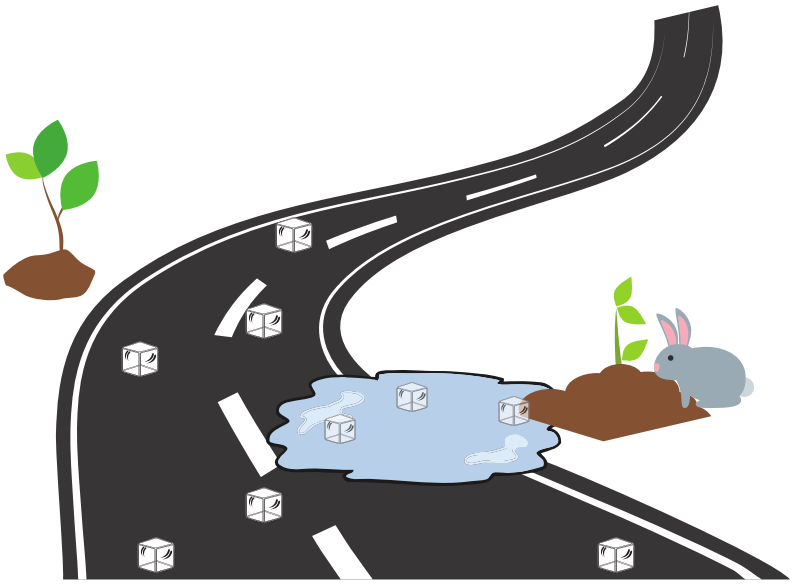
- Suggested juices: Apple juice, cranberry juice, carrot juice

Highways in Winter Weather

How Salting Roads Harms the Environment

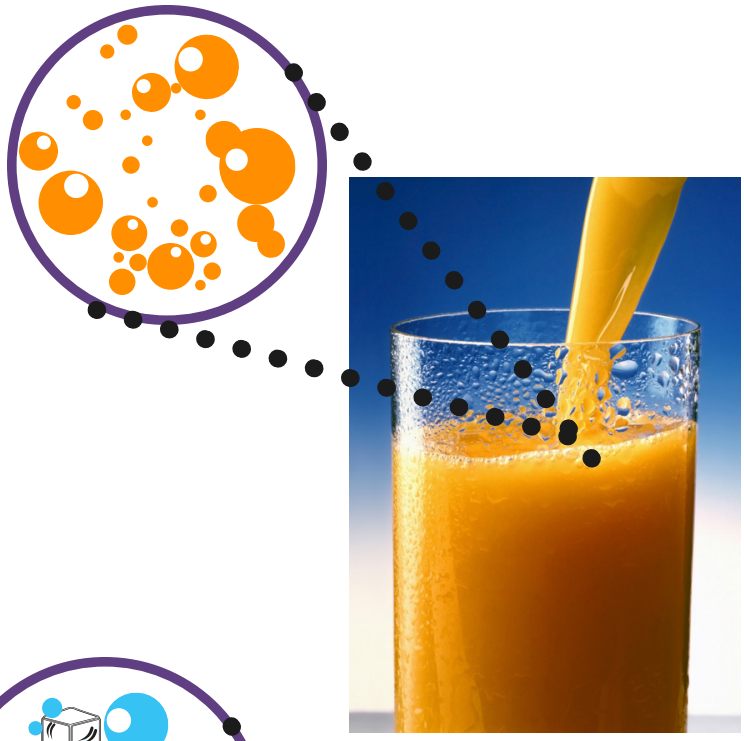
Salt leaves the truck and hits the highways, melting ice. The salt dissolves into tiny particles you cannot see, but they are still there.

The tiny salt particles travel from the road into nearby plants and streams or rivers. The soil and plants absorb the salt particles. Animals eat the salt particles when they eat the plants.

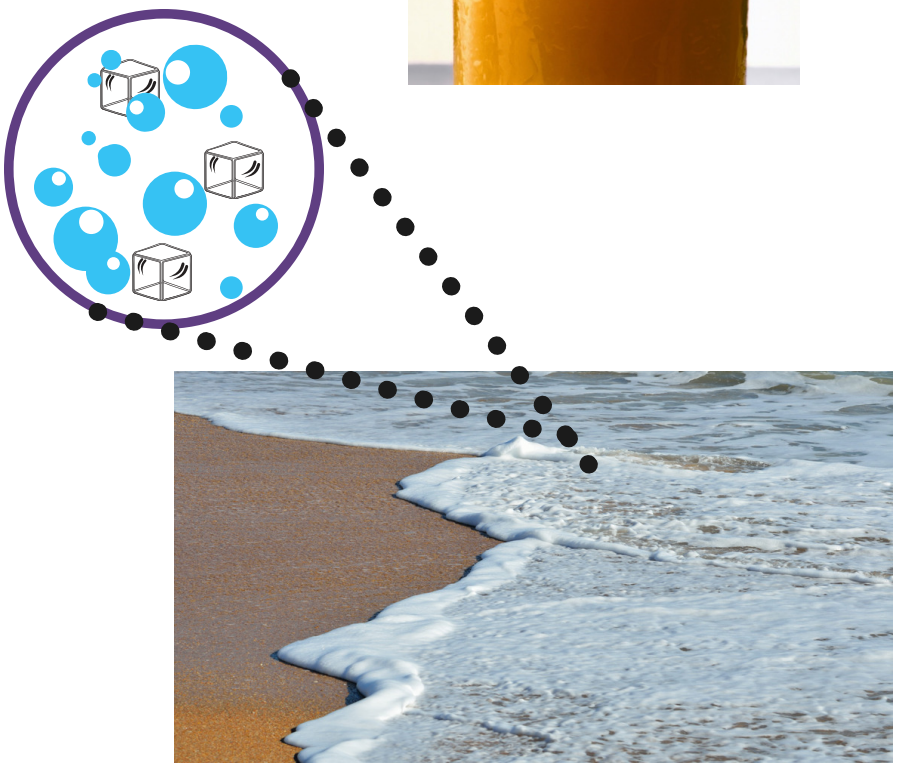


Made of Particles

The juice is made up of many tiny particles that you cannot see with just your eyes. Even with a magnifying glass, you cannot see them!



Salt water is made up of tiny particles of water and salt. You cannot see them because they are so small!



Melting Ice off of a Highway

Step 1: Making the highway

Create a highway using cardboard, tinfoil, and other building supplies.

Requirements for highway:

- Waterproof
- Has edges
- Can fit inside of a tub or tray provided by your teacher

Step 2: Making the Liquid

- Your liquid must measure exactly 1 cup. This means all of the juice you use needs to add up to 1 cup. For example, this can be four 1/4 cups or one 1/2 cup and two 1/4 cups and so on.
- First, make a plan for how much of each juice you will add. Make sure your plan results in using in total 1 cup of juice.
- Write down how much of each juice you will add:

  Juice 1 name and amount: _____

  Juice 1 name and amount: _____

  Juice 1 name and amount: _____

- Check your math that the juices add up to 1 cup!
- Once you are ready, measure and add each juice to the larger cup or bowl your teacher gave you.

Step 3: Testing the Liquid

Test to see how long it takes liquid to melt ice.

- Place highway in a plastic bin or on a plastic lunch tray.
- Place one ice cube on top of the highway.
- Get your timer ready!
- Pour the liquid your group made on the highway. Start the timer right away!
- Time how long it takes to melt the ice cube. Make sure someone is in charge of the timer and starts timing the moment the liquid is poured on to the highway and stops when the ice is melted!
- Record how long it took your group's liquid to melt the ice on your highway:

_____ : _____
minutes seconds

Step 4: Compare your results with other teams in your class!