

# Ice and Seek: Instructions

## Before you start:

- Do *not* taste any of the ices!
- Do *not* touch any ice directly. Use gloves to handle it.
- Do *not* smell the ice directly; wave your hand over it to bring the smell to your nose.

## Use the tools to examine the ices:

- What does it look like?
- How hard is the ice? Lightly scratch it a few times with the spoon.
- How cold is it? Take the temperature of the ice by sliding the thermometer underneath the block and leaving it there for a minute.
- How cold is it? Can it make metal vibrate and hum?
- What does it smell like? Wave your hand over the ice to bring the smell to your nose.

## Discuss with your team:

- Which ice is it? With your team, read the description of the ices on the "Ice Characteristics" sheet and determine which ice is at each station.

# Ice and Seek: Team Observations

<p><b>Sample Number</b></p> <p>_____</p>	<p><b>Observations</b></p> <p>Color, shape:</p> <p>Hardness: _____ Temperature: _____</p> <p>Smell:</p> <p>Other:</p>	<p><b>Predictions:</b> (What type of ice is this?)</p>
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# Ice Characteristics

## Alcohol Ice

The alcohol ice in this experiment is about 50% isopropyl alcohol and 50% water. (Your family might keep this kind of alcohol in their medicine cabinet.) Pure alcohol would not freeze in a home freezer.

Isopropyl alcohol ice :

- ✦ freezes at 127°F below zero (-89°C)
- ✦ melts at temperatures above -127°F (-89°C)

This mixture:

- ✦ is a little mushy; it is not as hard as water ice
- ✦ has a slight odor of alcohol
- ✦ has a whitish color, appears cloudy

## Carbon Dioxide (CO<sub>2</sub>) Ice - Dry Ice

At the temperatures and pressures on Earth's surface, dry ice *sublimates*, or changes directly from a solid to a gas

Carbon dioxide ice:

- ✦ freezes at -110°F (-79°C)
- ✦ melts at temperatures above -110 °F (-79°C)
- ✦ is very hard
- ✦ has no smell
- ✦ is opaque (a milky white)

## Water Ice

Water exists on Earth in three states - liquid, solid (ice), and gas

Water ice:

- ✦ freezes at temperatures colder than 32°F (0°C)
- ✦ melts at temperatures above 32°F (0°C)
- ✦ is relatively hard
- ✦ has no smell
- ✦ is transparent (clear) or opaque (cloudy) - or both!