

# The States of Water



## What you need:

- A saucepan
- Water
- A cooktop



Put ice cubes in the saucepan  
= **solid state**.



Heat gently: the ice cubes melt and become water  
= **liquid state**.



Continue heating: the water boils and turns into steam  
= **gaseous state**.



Place a cold plate above the pan: the steam condenses into droplets = **liquid state again**.

## Why do I make steam by blowing on car windows when it's cold?

Fog on car windows (or on any cold surface) is a phenomenon related to water condensation—that is, the transition of water from a gaseous state (vapor) to a liquid state.

## Why does it happen?

### Air contains water vapor

When we breathe, speak, or even sweat, we release water in the form of (invisible) vapor into the air. In a car, this humid air is trapped inside.

### Windows are cold

In winter or cool weather, car windows are colder than the interior air. When water vapor comes into contact with a cold surface (like the window), it cools down and turns into tiny water droplets: this is steam.

### Condensation

It is the same phenomenon that creates dew on the grass in the morning or droplets on a cold glass of water in summer.

## What are the different states of water?

### Sublimation

**Solid → Gas**

ex.: on Mars, ice turns directly into vapor without becoming liquid

### Liquid condensation (liquefaction)

**Gas → Liquid**

ex.: steam on a mirror after a hot shower

### Melting (Fusion)

**Solid → Liquid**

ex.: an ice cube that melts

### Solid condensation

**Gas → Solid**

ex.: formation of frost on a very cold window in winter

### Solidification (freezing)

**Liquid → Solid**

ex.: water that freezes

### Vaporization

**Liquid → Gas**

ex.: water that boils at a specific temperature (the boiling point)

