



#MeasurementAtHome
npl.co.uk/measurement-at-home

Ice cube melt

Does ice melt fastest on land, in fresh or salty water?

- ❖ does water saltiness affect melt time?
- ❖ which affects sea levels most - ice in oceans or on land?

estimated time: overnight freezing of ice cubes, 1 hour for water to reach room temperature, then most of the action takes a few minutes.
no prior knowledge needed.

Instructions

watch the video (<https://youtu.be/a36PsaUPMR4>)

1. Add food colouring to water in a jug before pouring into an ice cube tray and put the tray in a freezer overnight.
2. Place 2 containers of water (about 2/3rds full) and a plate on a surface indoors.
3. Dissolve salt in one water container (about 5 teaspoons per litre). Then wait for about an hour for it all to reach room temperature.
4. Take 3 equal sized ice cubes, place one in each container and one on the plate. (Optional: measure water temperature.) Start the timer.
5. Record the time each ice cube takes to melt.
6. See what happens to the melted ice by watching the food dye. If you have a thermometer, measure water temperature once cube has melted.
7. Enter results below or into NPL webpage:

npl.co.uk/measurement-at-home/ice-cube-melt

Equipment required

- 2 equal sized transparent containers about a litre capacity
- a plate
- an ice cube tray and a freezer
- food dye
- tap water
- salt
- a clock or timer
- (optional thermometer)

Risks

- ❖ mop up spilt water immediately

SI measurement unit

- ❖ second (s) for time (and minute = 60 seconds)
- ❖ kelvin (K) for temperature (optional)

Challenge topics

- ❖ **climate measurement**, measurement science, maths

Thoughts, tips and information

- ❖ do differences in food colouring flow give a clue about what happens in the two water samples?
- ❖ NPL is helping check average ocean level changes with mm precision
- ❖ fresh water from melted glacial ice may affect the world's thermohaline circulation of the global ocean conveyor belt

time for ice cube to melt on plate (in minutes)

time for ice cube to melt in fresh water (in minutes)

time for ice cube to melt in salty water (in minutes)

did the dye mix into the water the same way in both cases?

did you measure any temperature change in the water?

Adult direction or supervision is required. All experiments are carried out at your own risk.
For more experiments, visit NPL Measurement at Home.