

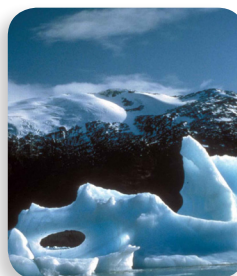


## Changes in State STEM Kit - Ice to Climate Change



**NEW**

**Includes Activity Guide**



Contains two investigative area and six STEM investigations that teach students about heats of fusion and reaction, thermochemistry, iceberg types and thermohaline circulation and climate change. The kit includes enough materials for 40 students working in groups of 4, as well as PDF Teacher and Student Guides and other digital content.

### Item No.

### Description

AISCSKIT

Changes in State STEM Kit

## Activity Summaries

### Activity 1 - Learning About Heat of Fusion

(GUIDED - MODEL EXPERIMENT)

Students calculate the quantity of heat exchanged between the water and the ice using a calorimeter. When the heat lost is equated to the heat gained, the resulting equation is solved to determine the latent heat of fusion. This experimental value is derived using a 'commercial' calorimeter and a simple 'group-assembled' calorimeter. These experimental values are compared to the standard (accepted) value of 80 calories/gm  $L_{WATER}$ .

### Activity 2 - Climate Change: Modeling Icebergs Melting in Seawater

(GUIDED - INDEPENDENT INVESTIGATION)

Students create an investigation model to explore the following questions: Will ice cubes melt faster in distilled water or in salt water? What implications does this have for glacial ice melting? Students use their experimental data to predict how long it takes for an iceberg to melt!

GOING FURTHER: Estimating iceberg size, measuring iceberg draft vs. freeboard relationships in seawater (Archimedes Principle), estimating draft and freeboard in photographs, estimating iceberg mass, identifying iceberg features.

### Activity 3 - Is Ice Melting an Exo or Endothermic Reaction?

(GUIDED - MODEL EXPERIMENT)

There are many factors involved in choosing a commercial ice-melt product. One key question is whether the substance is involved in an endothermic or an exothermic reaction process?

### Activity 4 - Determine The Most Efficient Ice-Melt Product

(GUIDED - INDEPENDENT INVESTIGATION)

Students predict whether anhydrous salts would have the most exothermic reactions, compared to hydrated compounds, when mixed with water and thus be the best ice-melts.

### Activity 5 (STEM Activity) - Designing an Ice-Melt Strategy for City Sidewalks

(GUIDED - MODEL EXPERIMENT)

Student groups recommend an appropriate deicer providing the best value, with the smallest environmental impact, for keeping sidewalks in the downtown area safe and accessible for tourists during the winter season.

### Activity 6 - The Eutectics of Ice Cream

(OPEN INQUIRY - INDEPENDENT INVESTIGATION)

Students explain how the procedures they follow allow them to make ice cream!

### Skills/Concepts

- Experimental/Engineering Design
- Investigating
- Physical State
- Scientific Method
- Measuring
- Data Analysis
- Spreadsheet Preparation
- Communication
- Technology
- Developing & Using Models
- Using a Calorimeter