

Explore: Engineering Challenge 2: Heat

Part A. Experimental Set-up: Insulating the Cups

- (1) Put each insulation material (foil, Styrofoam, cotton, air) at the bottom of the plastic cups (each material goes in a separate cup). Just fill to about an inch. You will need to tear up the aluminum foil, Styrofoam cups and cotton balls into small pieces.
- (2) Place the small (3 oz.) cup inside the plastic cup and fill all the spaces around the little cup with the insulating material. Again, the cup filled with air is already done!



This activity was adapted from “What is the best insulator: Air, Styrofoam, Foil or Cotton” activity from teachengineering.org.

Part B. Experiment: Which cup will freeze first?

- (3) Fill each small (3 oz.) cup with 3 spoonfuls of water.
- (4) Put the cups in the freezer for 15 minutes.
- (5) **Make a prediction:** Which cup will freeze first?
- (6) After 15 minutes in the freezer, take the cups out and record your observations. Which cups are starting to freeze? Do some cups have more ice than others?
- (7) Put the cups back in the freezer. After another 15 minutes in the freezer, take the cups out and record your observations.

Part C. Experiment: Which cup will melt first?

- (8) Remove the cups from the freezer and place them in an aluminum tray.
- (9) **Make a prediction:** Which cup will melt first?
- (10) Pour hot water into the tray. Record your observations.