For real: three heat tests

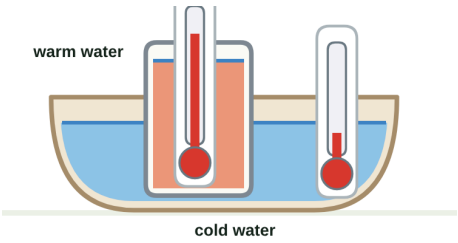
Name: Class: Date:

Do each test here with real things first. Then do it on the screen, and see what the screen adds.

PART 1 A warm cup in a cold bowl

Aim: To find out what happens to the temperatures when a cup of warm water stands in cold water.

You need: A metal cup or a thin plastic cup of warm water that your teacher has checked, a bowl of cold water, 2 thermometers and a clock or a timer.



> **Take care.** Your teacher makes the warm water and checks that it is no hotter than a bath. Hold a thermometer by its top and do not stir with it. Wipe up spills straight away.

1. Read both thermometers. Write the numbers in the first row of the table.
2. Predict which way the heat will move. Circle your prediction.
3. Stand the cup in the bowl. Keep the two lots of water apart.
4. Read both thermometers every 2 minutes, and write the numbers in the table.
5. Draw arrows on the picture to show which way you think the heat moved.

I predict that heat will move: from warm to cold | from cold to warm | not at all

Time	Warm water, in the cup (°C)	Cold water, in the bowl (°C)
At the start		
After 2 minutes		
After 4 minutes		
After 6 minutes		
After 8 minutes		
After 10 minutes		

1. What happened to the two temperatures?

2. Which way did the heat move? How do you know?

Answers (turn the page round). Part 1: the warm water cooled and the cold water warmed, until they were the same or nearly the same; heat moved from the warm water to the cold water; we know because the warm water cooled while the cold water warmed; the room warms or cools real water too, so the numbers may not meet exactly. **Part 2:** the metal usually feels coldest and the plastic least cold, but a thermometer reads the same on all of them; heat leaves your fingers quickly into metal and slowly into plastic; in a hot room they may all feel the same. **Part 3:** the ice with no wrap usually melts faster; the sock makes no heat, and it slows the heat moving from the warm room into the ice.

PART 2 The touch test

You need: A metal spoon, a ceramic mug or plate, a plastic spoon or cup, and other things that have been in the same room for an hour. A thermometer to tape on to each thing, if you have one.

> **Take care.** Use things with no sharp edges or chips. Put a mug or plate where it cannot fall. Ask your teacher before you test a thing of your own.

If you have a thermometer, measure each thing before anyone touches it. Then touch each thing once, with your fingers flat, and let it cool before the next person has a turn. Put the things in order: write 1 for the one that feels coldest.

Thing	What is it made of?	How cold did it feel? 1 is the coldest.	The thermometer reads	Did heat leave your fingers quickly or slowly?
A metal spoon				
A ceramic mug or plate				
A plastic spoon or cup				

1. The things were all in the same room. Why did some feel colder than others?

PART 3 The ice in the sock

You need: 2 ice cubes of the same size, a woolly sock, a glove or a tea towel, 2 plates and a clock or a timer.

1. Predict: which ice cube will melt first, the one in the sock or the one with no wrap? Tell your partner.
2. Put one ice cube inside the sock, on a plate. Put the other on a plate with no wrap. Do not eat the ice. Wipe up any water on the floor.
3. Look at both every 10 minutes. After 20 minutes, draw both ice cubes in the boxes.

The ice with no wrap, after 20 minutes

The ice from the sock, after 20 minutes

2. Which ice cube melted faster? What did the sock do?