

Worksheet 2

## Which cup keeps the chocolate hot for longer time?

You have two cups of different material. Both cups have the same plastic cap.

1. In each cup you put 100ml of water at a temperature of 50 °C.

(α) I make a hypothesis about which of the two glasses will keep the water hot for a longer time and justify.

(β) I explain why I should put the same amount of water in the two cups.

2. I close the cups with their lids and I place the thermometer in the hole of the lid, so that the lower end of the thermometer is approximately in the middle of the height of the water in the cup.

(α) Record the temperature of the water in each glass every minute and record your measurements in the table below.

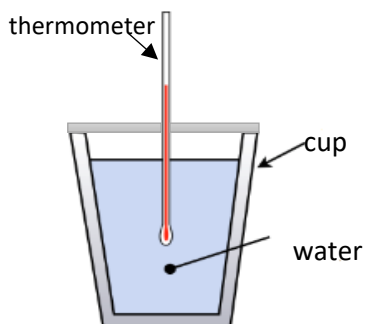
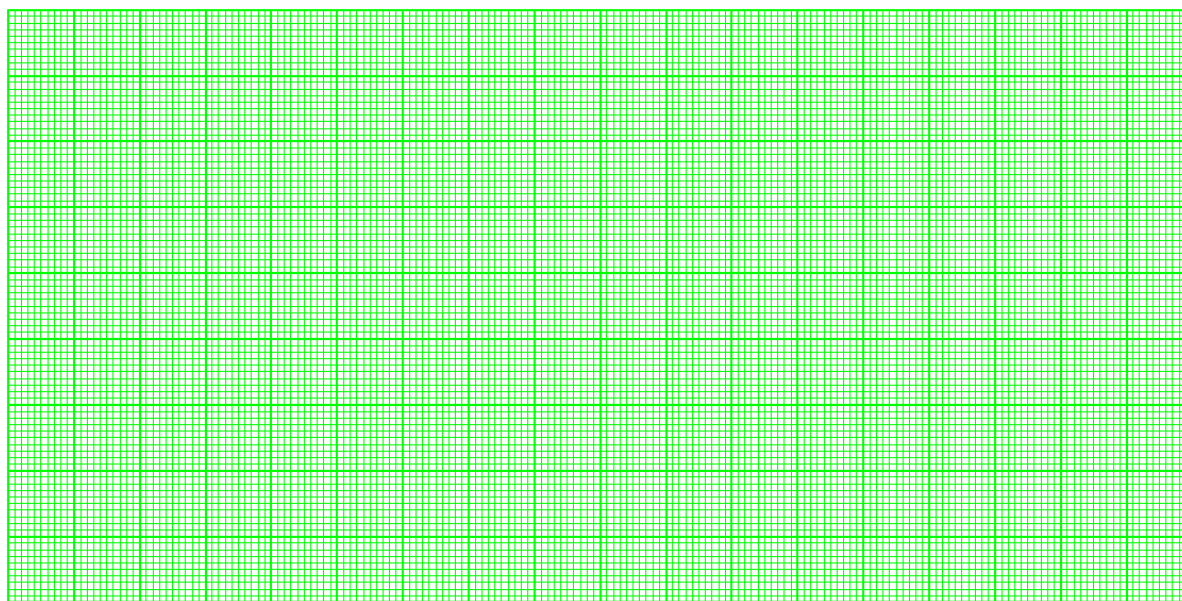


Table 1: Temperature of the water in the two glasses

Time (min)	1° glass .....	2° glass .....
0		
1		
2		
3		
4		
5		
6		
7		

Time (min)	1° glass .....	2° glass .....
8		
9		
10		
11		
12		
13		
14		
15		

(β) For each of the two glasses, draw the graph of the water temperature in relation to time in the same system of axes.



(γ) From the graph determine the time interval in which the water temperature decreased from 50 °C to 40 °C.

$\Delta t_1 =$  \_\_\_\_\_ ,  $\Delta t_2 =$  \_\_\_\_\_

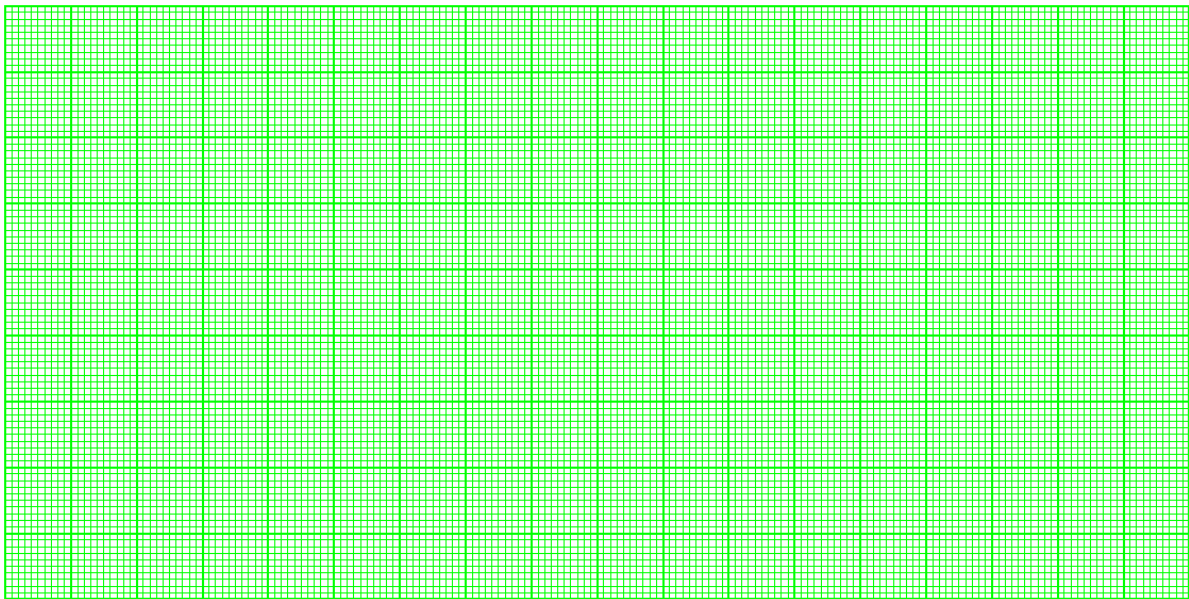
(δ) I discuss my results with my colleagues.

3. (α) Exchange the results you found in point 6 with the other groups and complete the table below.

**Table 2: Temperature reduction time**

Material	Aluminum	Glass	Plastic	Polystyrene	Porcelain	Paper
$\Delta t$ (min)						

(β) Draw a bar chart for the time it took to reduce the water temperature from 50 °C to 40 °C in the various glasses.



(γ) Using the bar chart, select the glass that keeps its liquid contents warm for longer.

