

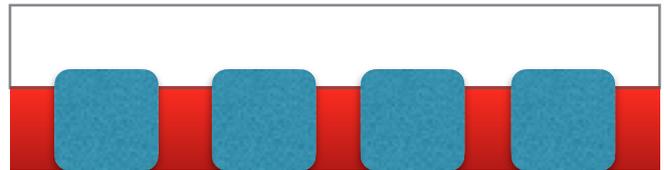
## 9.3 Investigating Heat Movement in Matter

### Part A Testing Heat Conduction

#### Equipment

Use 4 different cups if possible try metal, glass, china and plastic cups  
 4 thermometers or temperature sensors  
 hot water bath ( large tray or tote box)  
 measuring cup or cylinder.  
 source of hot water  
 cool or tap water.

Put 200mls of cool water in each.  
 Place each of these cups in a large water bath with hot water ( safety < 50°C) just below the rims of the cups. Make sure water does not overflow from bath.



Now measure the rise in temperature in each cup using thermometers or temperature sensors.. (You can test with your finger thermometer but as you tested previously its not very reliable )

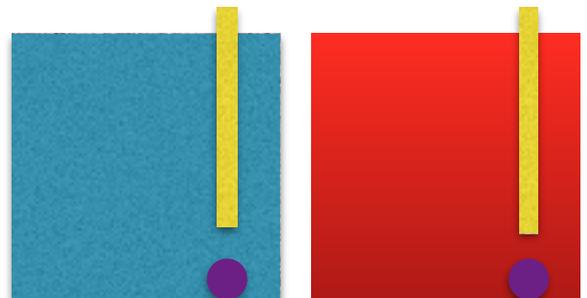
- Q. Which material was the best conductor?
- Q. What factor did you use to make this decision?
- Q. What other variables may have affected this investigation?

### B Testing Heat Convection

#### 1. In Liquids

##### A. Comparing hot and cold

Use two large glass beakers or jars  
 Add 500mls of cold water to one and 500mls of hot water to the other  
 Add a drop of coloured dye through a straw to the bottom of each beaker.  
 Remove the straw and observe.  
 Q Which beaker did the dye mix quicker? Why?



##### B. Looking at Convection currents (**Safety: Fire hazard**)

Use a large pyrex beaker of water ( 1 litre) Add coloured dye or glitter through a straw to the bottom of the beaker.  
 Put on a Hotplate and observe the dye/ glitter  
 Q Why does it rise then sink again?

#### 2. In Air

You can make a convection spiral from paper.

Put cotton through the centre and hold it above various hot materials. (Safety: Use hot water or hot ground in the sun or a lamp not an open flame!)

Q. Does the movement change with temperature?  
 Observe the wind outside. Q. Where would the hot air be rising and cold sinking?

