4.1 Thermal Equilibrium

Comparison between Temperature and Heat

Characteristic	Temperature	Heat
Definition		
Unit SI		
Measurement instrument		
Base / derived quantity?		

When an object is heated		
When an object is cooled		

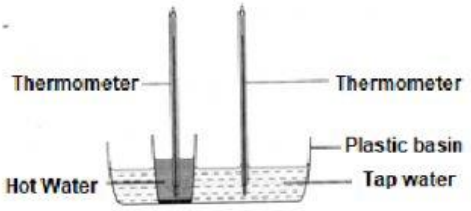
Activity 1:

Aim: To show thermal equilibrium between two bodies in thermal contact

1. Fill the beaker with hot water.
2. Place the beaker of hot water into a basin containing tap water.
3. Observe the temperature changes in the hot water and tap water using the thermometers.
4. After about 10 minutes, feel the hotness of the water in the beaker and basin with your finger.
5. Continue your observation until there is no change in the readings of the thermometers.
6. Record your observations.

Initial temperature of water in beaker	27° C
Initial temperature of water in basin	50° C

temperature of water in beaker	37° C
temperature of water in basin	37° C



Discussion:

1. State what happens to:

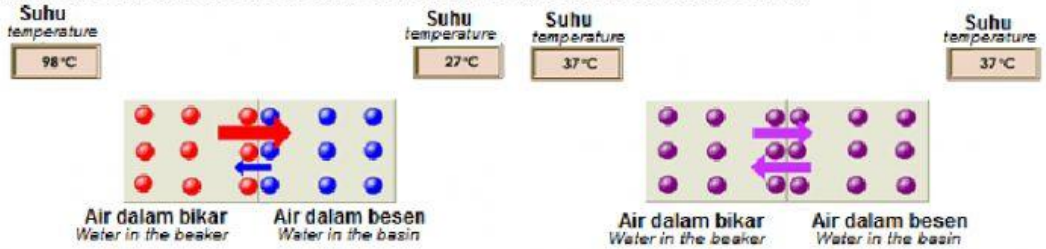
Temperature of water in beaker.....

Temperature of water in basin: .....

2. What do a rise and fall of temperature of the water indicate?

Transfer of occurs

3. Discuss the transfer of heat between the water in the beaker and the water in the basin.



- Heat is transferred from hot water in the beaker to the tape water with rate.
- Heat is transferred from the tape water to the water in the beaker with rate.

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4. **State the direction of net heat transfer between the two objects.**

The direction of net heat transfer is from

5. **Compare the temperature of both thermometer after 10 minute.**

The temperature of both thermometer are

6. **What happens to rate of heat transfer after 10 minute?**

Heat is transferred at the rate between water in the beaker to water in the besen.

7. **What can you say about the net rates of transfer of heat when the readings of the two thermometers become equal?**

There is no net heat transfer between both readings. The net rates of heat transfer is

The two objects are said to be

Explain Thermal Equilibrium

THERE IS NET FLOW OF HEAT BETWEEN TWO OBJECTS.

TWO OBJECTS HAVE THE TEMPERATURE

Example of thermal equilibrium

1. **Explain how a wet towel is placed on the forehead of a person who has high fever.**



Temperature of the body is than the towel.
- Heat is from the body to the towel.
- Until it reaches
- The body heat and its temperature

2. **Cooling drinks . A hot drink can be cooled by adding a few ice cubes to the drink.**



A hot drink can be cooled by adding a few ice cubes to the drink.
- from the hot drink is transferred to the colder ice until between the ice and water is reached.
- Ices cubes melt. The temperature of the drink and the drink

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