



Science

Grade 7





Heat and Temperature

3.9 - Uses Thermometer correctly

3.10 - Demonstrates transference of heats and its effects

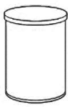
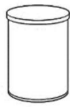
Measuring Temperature

- 01) How do you feel when you stay outside in sunlight.
.....
- 02) How do you feel when you touch a sample of soil with gravels and sand?
.....
- 03) What type of energy is received for your feel mentioned above?
.....
- 04) What is our main source of energy?
.....
- 05) Write two sensations that we feel due to the sunlight at day time and night time.

	Sensations
Day time
Night time

- 06) Take two identical cans.
- Fill one of the can with water and keep it in sunlight.
 - Take the other one and fill equal volume of water which was kept inside the house(cold water).
 - Dip your hands into the two water tins separately.
 - Record what you feel.



	
Water can kept in sunlight	Water can filled with water which was kept inside of the house.
Observations	
Water was warmed by receiving energy .	Water was not warmed due to not receiving the energy..
The heat energy is received by the to warm the water.	

07) What are the methods of using thermal energy to heat water at home?

.....

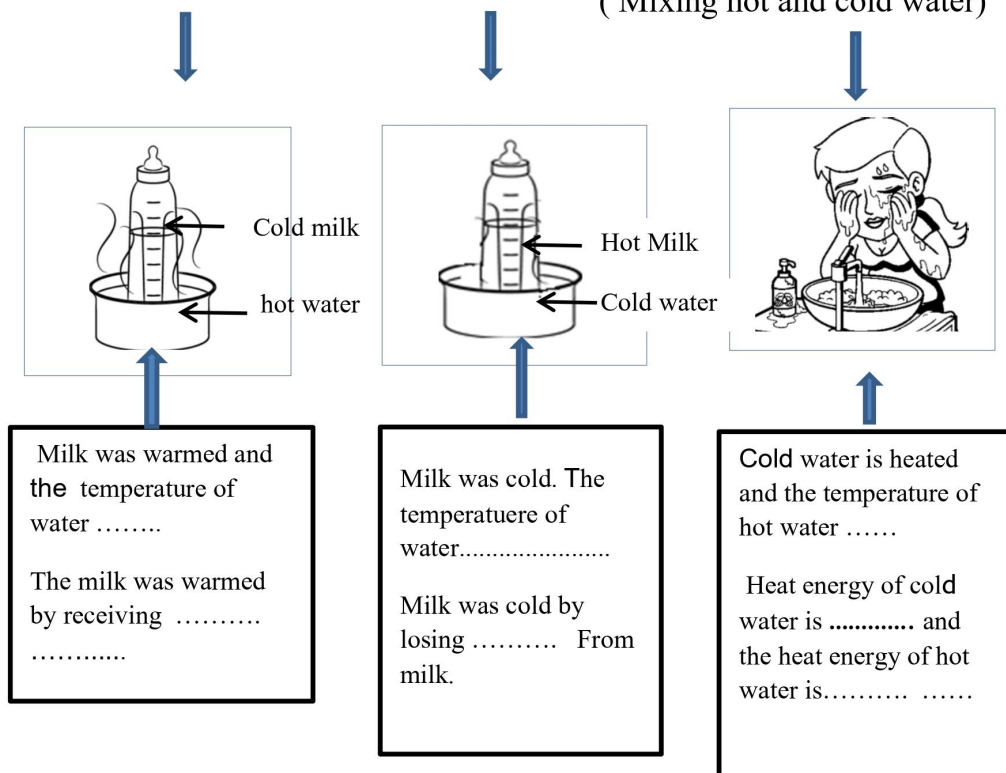
08) You may have seen the following instances, where small kids are at home.

Warm baby bottle

Cooling bottle

Luke warm water to wash face

(Mixing hot and cold water)





- 09) Temperature of a substance decreases (Cools) because of heat from that object.
- 10) Temperature of a substance increases (hot) because of thermal energy from that object.
- 11) The measurement of warmness or cold ness of a substance is known as its

12) You may have seen the following two instances at home.



overflowing milk while boiling



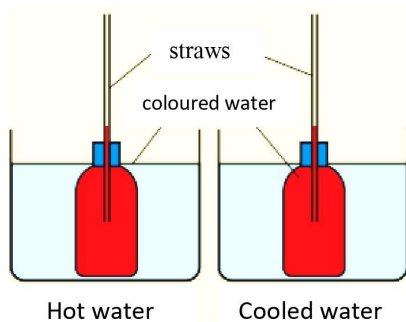
water comes out of the spout
While boiling water filled kettle

13) What is the effect of heat in both these instances?
.....

14) Do the following activity to observe the liquid expansion due to heat.

Use the following substitute items to do the activity.

(Activity 14.2 in the text book)



(Take care when using hot water)

Glass vial = glass bottle
Tube of pen = Drinking straws
Beakers = Jugs
Red Ink = Red Colouring / dye
Clay can be used to seal the area where drinking straws are connected to the lid



15) Observe the liquid levels of the straws while doing the above activity and complete the given grid.

	warm water	cold water
Observations

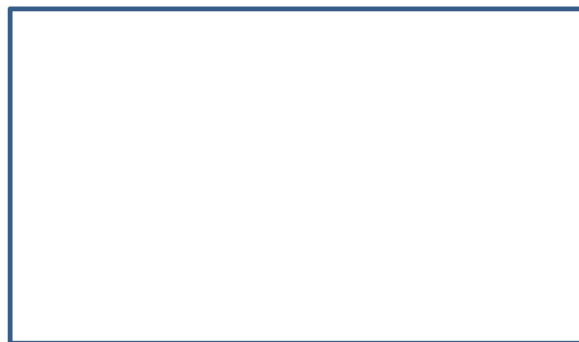
16) What can be concluded by this activity?
.....

17) What is known as liquid expansion?
.....
.....

Thermometers

18) What changes can be done to the set up to measure the amount of liquid rising up?
.....

19) Draw a labelled diagram to show the change you made for the setup, in the given box. .



20) What is the device (equipment) that you have made using the experience gained by the above ?
.....

21) The property of of a liquid is used in making liquid thermometers.





22) Name the two liquids used in thermometers.

.....

23) There are two types of thermometers according to the liquids that they use. What are they?

.....

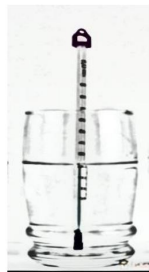
24) Identify the following thermometers and name their parts.

<p>Scale</p> <p>Capillary tube</p> <p>Bulb</p>		<p>.....</p> <p>.....</p> <p>.....</p>		<p>.....</p> <p>.....</p> <p>.....</p>
	<p>..... Thermometer</p>		<p>..... Thermometer</p>	

25) Why the alcohol used in thermometer is coloured?

.....

26) The diagram below shows a thermometer placed in a hot water vessel.



I. What happens when the thermometer is placed in hot water vessel?

.....

II. Why does that happen?

.....

.....



Scales of Thermometers.

27) What are the three scales that used to measure the temperature?

.....
.....
.....

28) Complete the given table using the different scales of thermometers.

Temperature scales	Unit	Symbol













29) Write the international standard unit of measuring temperature.

.....



Melting point and Boiling point

30) You may have seen the change of state of following instances due to loss of heat or receiving heat.

			<ul style="list-style-type: none">• Ice turns into water byheat. <p>This happens at a constant temperature.</p>
<p>Solid (Ice)</p>		<p>Liquid (water)</p>	
			<ul style="list-style-type: none">• water turns to water vapour byheat <p>This happens at a constant temperature.</p>
<p>Liquid(water)</p>		<p>Gas (Water vapour)</p>	
			<ul style="list-style-type: none">• Water vapour turns into water by..... heat. <p>This happens at a constant temperature.</p>
<p>Gas (Water vapour)</p>		<p>Liquid(Water)</p>	
			<ul style="list-style-type: none">• Water becomes to Ice by Heat. <p>This happens at a constant temperature.</p>
<p>Liquid (Water)</p>		<p>Solid (Ice)</p>	



31) Define the following terms.

Melting point

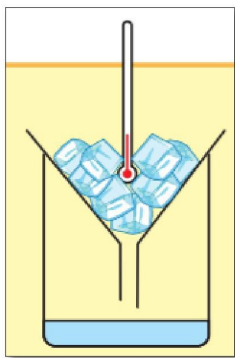
.....
.....

Boiling point

.....
.....

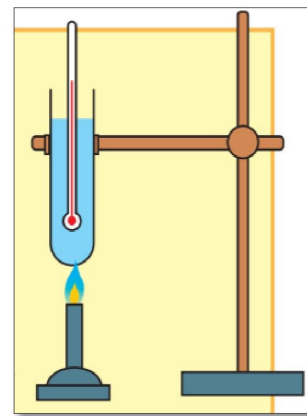
32) What constant temperature of the water is measured by the activity shown below?

Mark with it an arrow.



Melting point

Boiling point



Heat the water till it boils

- 33) According to the thermometer reading of the above activity,
- Colour the circle in red when the temperature gets a higher value.
 - Colour the circle in blue when the temperature gets a lower value.

34) The temperature that ice turns to water is known as..... of that Ice.

The temperature that water turns to Ice is known as..... of water.

In both instances the temperature is constant.



- ★ Boiling point and Freezing points of water are fixed points.
- ★ Above readings are important when calibrating the thermometers.

35) The boiling point of water point at sea level is the highest fixed point and the freezing point of water at sea level is called as the fixed point.

36) Write the boiling point of water and melting point of ice according to the each temperature scales in the table below.

Temperature	Celsius Scale	Fraenheit Scale	Kelvin Scale
Boiling point of water (1 atm of atmosperic pressure)			
Melting point of Ice (1 atm of atmosperic pressure at sea level)			

37) The following data is provided for setting thermometers on the Celsius scale and Fahrenheit scale. Write ahead how many equal parts should be divided between those values.

	Melting point of Ice (Lower fixed point) 1 atm of atmosperic pressure at sea level	Boiling point of water (vapour) (Upper fixed point) 1 atm of atmosperic pressure at sea level	Number of equal parts
Celsius Scale	0°C	100 ⁰ C
Farenheite Scale	32 ⁰ F	212 ⁰ F



Using Thermometer Correctly

38) What are the factors that should consider when taking the readings from a thermometer?

.....

.....

.....

.....

.....

.....

39) Human body temperature is approximately a constant value.

Write the human body temperature according to the each temperature scales.

.	Celsius Scale	Farenheit scale	kelvin Scale
Human body temperature			

40) Do you remember how you measured the body temperature when you have fever?



I. What is this instrument?

.....

II. What is the liquid inside it?

.....



III. What happens to the mercury column when you place the bulb of the thermometer under the tongue?
.....

IV. Why did the mercury column rise up?
.....
.....

41) Write the differences between the clinical thermometer and the laboratory thermometer .

clinical thermometer	Laboratory mercury thermometer

42) what are the steps to follow when using a clinical thermometer

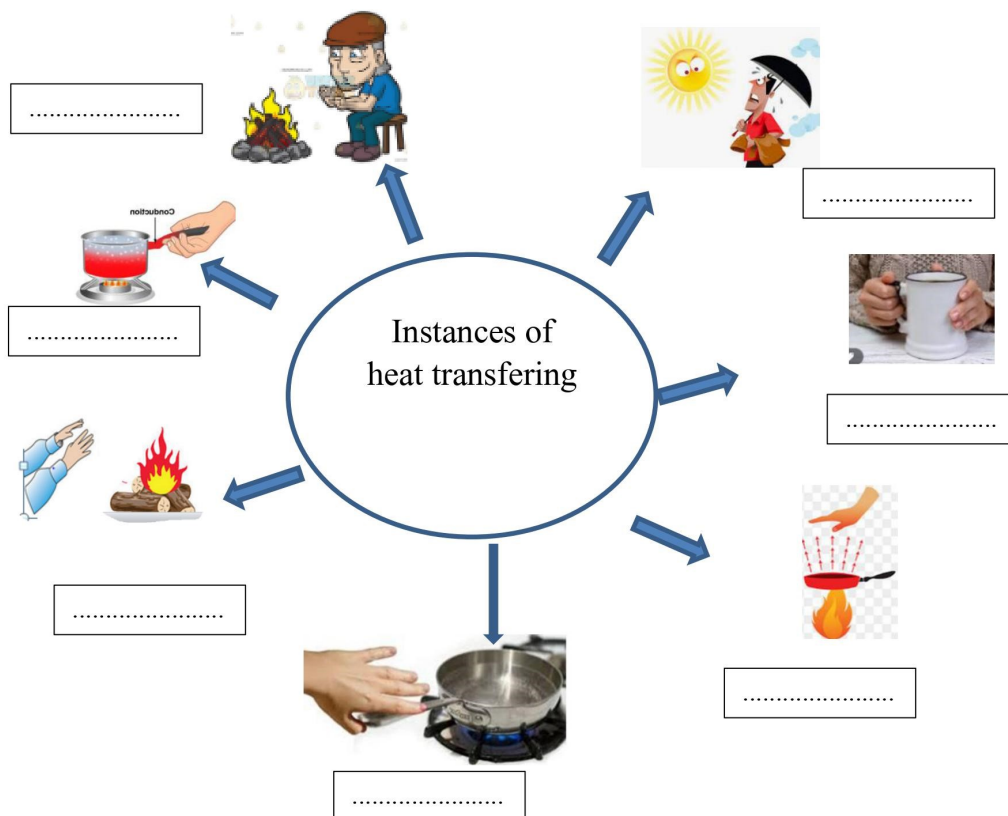
.....
.....
.....
.....
.....
.....
.....



Heat Transfer

The sun is our largest heat source. Though the sun is some millions of kilometers away from the earth, we get solar heat. This indicates that heat has travelled from sun to the earth.

43) Identify the following instances when heat is transferred.

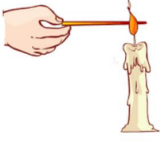




44) Travelling of heat from one place to another place is called as

.....



45) Do the following activity and write the observations in the given grid.

Activity		Observation
<ul style="list-style-type: none"> Hold a metal rod to the flame of a candle (Instead of a metal use a wire or a needle) 		
<ul style="list-style-type: none"> Hold your hands above the candle flame 		
<ul style="list-style-type: none"> Hold your hands by the side of the candle flame 		

46) In all three instances of the above activity, we felt from the flame of the candle.

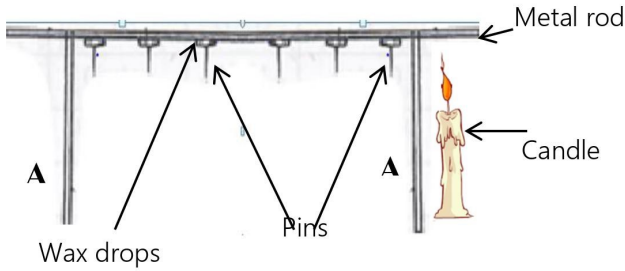
There are three methods of heat transferring

01. Conduction
02. Convection
03. Radiation



Heat Conduction

47) Get the observations by doing this activity.



- * Instead of the metal rod use a thick copper wire which cut from a wire. First place a small drop of wax on wire and fix pins on it, in 2 cm intervals, using candle wax as shown in the figure
- . Place the metal rod on the two pieces of thick cardboards as shown A. (Try to keep the cardboard pieces straight)
- * Keep the lighted Candle Closer to the metal rod

i. Why were wax drops used here?

.....

ii. What is the observation ?

.....
.....
.....

iii. This method of transferring heat from particle to particle without motion of particles through a solid is known as

iv. Write three materials which conduct heat well.

.....
.....
.....



v. Write three materials which do not conduct heat well.

.....
.....
.....
.....

vi. Name Five appliances that made of heat conductors and heat insulators you use at home .

What are the advantages of using them?

.....
.....
.....
.....
.....
.....
.....

Heat Convection

48) Have you seen that small twigs of trees above large fire are waving. what can be the reason for this?

48) Make a toy wind propeller using a paper. Hold it forward and run with it . what happens?

49) Light the hearth and hold the toy wind propeller above the fire. What happens? (Get the help of an adult to do this activity. Use a metal lid insted of the paper)

.....

50) How did the wind blow up in this instance?

.....



51) Name this phenomena.

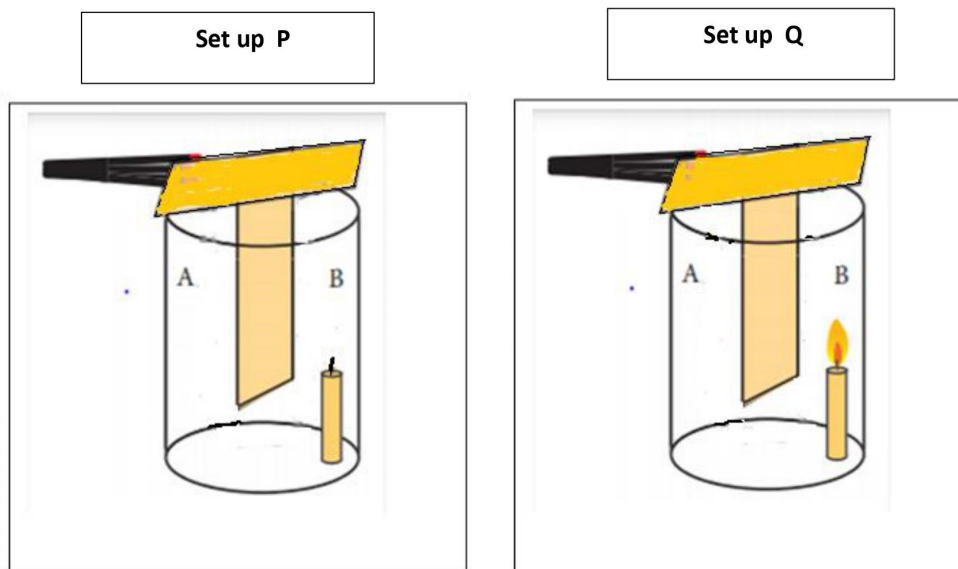
.....

52) Do the following activity to demonstrate the above phenomena.

- Find two wide- mouth gass bottels of same height (You can use Jam bottles or Horlicks bottles.)
- Cut the two pieces of cardboard to the shape as shown in the figure (T – shape) that is slightly wider than the diameter of the bottle and shorter than the height of the bottle.



- Then arrange the P and Q set ups as shown in the diagram.
- Place the unlit joss sticks on the A side of the P set- up and the lighted joss sticks on the A side of the Q set up as shown in the figure.
- Record the observations.





I. Write how the smoke travels in both set ups P and Q.

.....
.....
.....

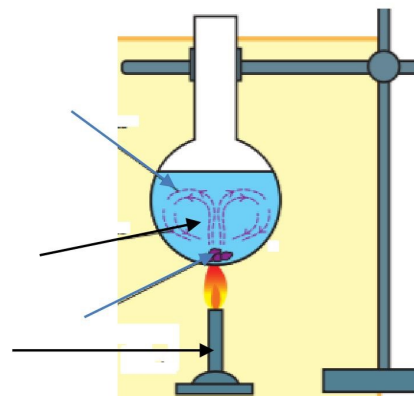
II. Why smoke of joss sticks is used for this activity?

.....
.....
.....

III. What can be concluded by this activity?

.....
.....
.....

53) The figure shows a set up to show that convection currents occur in liquids (Name the parts of the set up)



i. What was the procedure followed when dropping condis crystal into water?

.....

ii. What is the purpose of using Condis crystal for this activity?

.....
.....
.....

iii. Write the observations.

.....



.....

iv. What can be concluded by this activity?

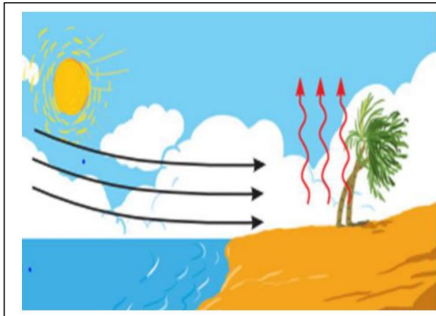
.....

54) The method of transferring heat through liquids and gases by conventional current is known as

55) Name the two types of convectional currents

56) The wind that blows from the sea towards the land is known as
 The wind that blows from land towards the sea is known as

57)



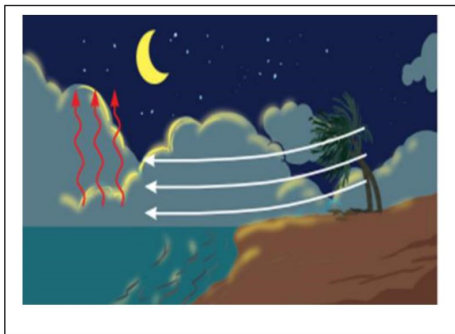
★ During day time land area and sea water heated due to the solar heat. But heats faster than

★ This cause the layer of air contacted with the land heat and rise up as currents.

★ To fill the low pressure area created on the land, air currents flow from the towards the land.

★ This is known as.....

58) Write how the wind blows in the same way as in the question in .



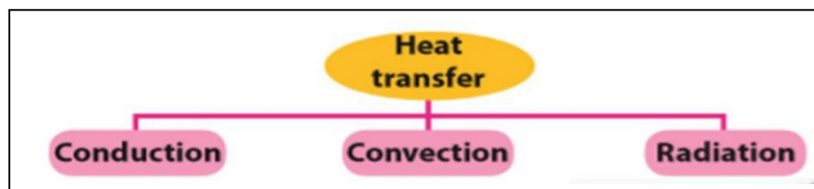
.....



Radiation



- 59) As shown in the above diagrams we feel warm, because heat travels towards our body by
- 60) Any object radiates heat.
- 61) Define the following terms and write the instances where you experienced.



--	--	--