CHAPTER: 01 – HEAT

PERIOD PLAN-03 :   Different substances have different specific heats

Affecting factors of specific heat

Specific heat – formula - Units

Content Analysis	Class Room Environment	Teaching Learning Material
Different substances have different specific heats : The rate of rise in temperature depends on the nature of the substance. That means different substances have different specific heat values. So they receives different amounts of heat energies.	**Activity-7 :** Take a jar with water and heat it up to 80°C. Take two test tubes with single holed corks. One of them is filled with 50 gm of water and the other with 50 gm of oil. Insert the thermometers through the holes of the corks and fit the corks one each into the test tubes. Now clamp them to a retort stand and place them in a jar of hot water. Observe the readings in the thermometers. **Observation :** The temperature in the thermometers increases gradually. The rate of rise in temperature of the oil is higher than the rate of rise in temperature of water.	Big glass jar, water, test tubes-2, rubber corks-2, two lab thermometers, retort stands-2
Affecting factors of specific heat: (1) At constant temperature, the amount of heat energy absorbed by a substance is directly proportional to its mass. $Q \propto m$	**Activity-8 :** Take 250 ml of water in one beaker and 1000 ml of water in another beaker. Note down the initial temperatures (may be same). Heat both beakers on the same pan of a stove till the temperature reaches to 60^{0}C. Note down the heating times. **Observation :** If the difference in temperature is constant, 1000 ml water takes more time for rising its temperature compared to that of 250 ml of water.	Stove, Two beakers, water, 250 ml measuring jar, lab thermometer
Affecting factors of specific heat: (2) For same mass, the change in temperature is directly proportional to the amount of heat energy. $Q \propto \Delta T$	**Activity-9 :** Take 250 ml of water in one beaker and 250 ml of water in another beaker. Note down the initial temperatures (may be same). Heat one beaker till it reaches the temperature up to 60°C and note down the heating time. Heat other beaker till it reaches the temperature up to 80°C and note down the heating time. **Observation :** for the same mass (250 ml of water) It takes more time for rising its temperature up to 80°C.	Stove, Two beakers, water, 250 ml measuring jar, lab thermometer
Specific heat – formula – Units : $Q \propto m.\Delta T \rightarrow Q = m.S.\Delta T$ (here S is constant) S is the specific heat for a given substance. The amount of heat required to raise the temperature of unit mass of substance by one unit is called Specific heat. Specific heat depends upon the nature of the substance. $S = \frac{Q}{m.\Delta T}$ The S.I. Unit is J/Kg-K . The C.G.S. Unit is cal/gm-^{o}C. 1 cal/gm-^{o}C = 1 K.cal/Kg-K = 4.2X10^3 J/Kg-K **Calorie :** The amount of heat energy required to raise the temperature of 1 gram of water by 1°C is called 1calorie. 1 cal = 4.186 J	**Conversation :** About specific heat – Definition - formula – units **Explanation :** Explains the relation between units of specific heat.	Chart Specific heat AV-clip
Lead 0.031cal/gm-^{o}C = 130 J/Kg-K Mercury 0.033 cal/gm-^{o}C = 139 J/Kg-K Brass 0.092 cal/gm-^{o}C = 380 J/Kg-K	**Table :** Values of specific heat of some substances	Chart