

HEAT AND TEMPERATURE/ऊष्मा तापमान

SI
Joule

उष्मा
Heat

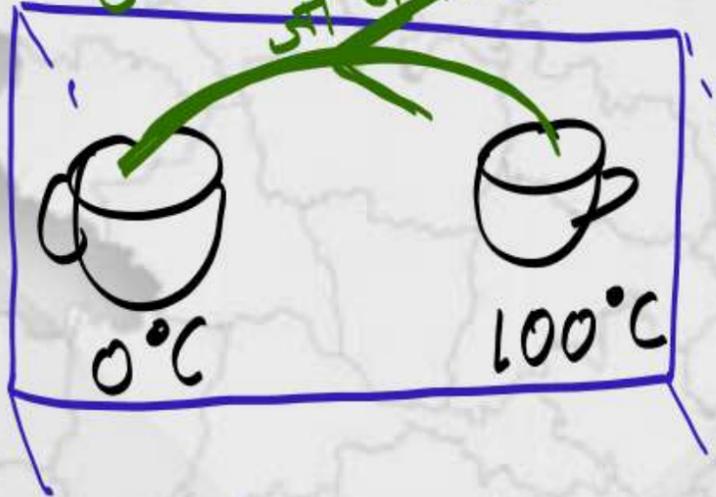
तापमान

Temperature

SI → Kelvin

(Hotness & Coldness)
जिस्त
ठंड

तापमान में अंतर होने के कारण जो बसती है



→ What flows due to diff in the tem

❓ The S.I unit of heat is "Joule".

❓ C.G.S is "calorie"

❓ Calorie-Amount of heat require to raise the temperature of 1 gm water by ~~10~~¹C/
1 ग्राम पानी का तापमान ~~10~~¹C तक बढ़ाने के लिए आवश्यक ऊष्मा की मात्रा.

$$1 \text{ Calori} = 1 \text{ gm} \longrightarrow +1^\circ\text{C}$$

British Thermal Unit(B.Th.U)/ ब्रिटिश थर्मल यूनिट

(B.Th.U)- - ✓

Amount of heat require to raise the temperature of 1 pound of water by ~~10 F~~ ^{1°F} / 1 पाउंड पानी का तापमान ~~10 F~~ ^{1°F} तक बढ़ाने के लिए आवश्यक ऊष्मा की मात्रा.

1 B.Th.U-252 calorie.

B.Th.U (1 pound \rightarrow +1°F)

Centigrade Heat Unit/ सेंटीग्रेड ताप इकाई-

Amount of heat require to raise the temperature of 1 pound of water by ~~100~~^{1°C}
 1 पाउंड पानी का तापमान ~~100~~^{1°C} तक बढ़ाने के लिए आवश्यक ऊष्मा की मात्रा.

1 pound \rightarrow +1°C

Calorie
 \downarrow
 1 gm \rightarrow +1°C

B.Th.U
 1 pound \rightarrow +1°F

❓ **Mechanical equivalent of heat/ऊष्मा का यांत्रिक तुल्यांक**

$$(J)=W/H$$

$$=4186\text{JOULE/kilo cal}$$

*If work of 4.186 joule is done 1 cal heat would be produced.

$$J = \frac{W}{H}$$

THERMOMETRY/थर्मोमेट्री-

Branch of Physics in which temperature is measured by various device. ✓✓

भौतिकी की वह शाखा जिसमें विभिन्न उपकरणों द्वारा तापमान मापा जाता है।

E.g-Thermometer, Thermocouple, pyrometer.



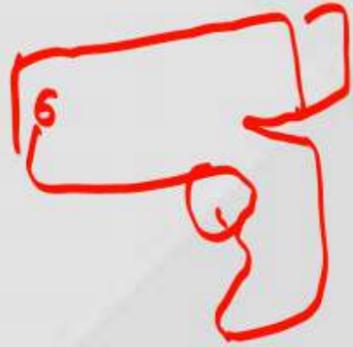
1) GAS THERMOMETER

A. H₂=Upto 500 C

500°C

B. N₂=Upto 1500 C

1500°C

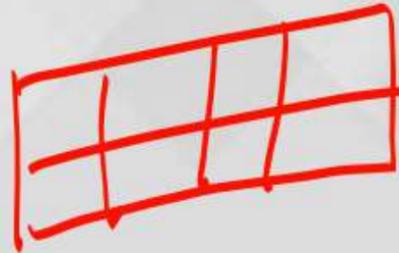


2) LIQUID THERMOMETER.

A. Alcohol=Below ~~-400C~~ to ~~-1150C~~.B. Hg= ~~-390C~~ to ~~3570C~~

$40^{\circ}\text{C} - -115^{\circ}\text{C}$

$-39^{\circ}\text{C} - 357^{\circ}\text{C}$



3) Clinical Thermometer/ क्लिनिकल थर्मामीटर-

From=95 F(35 C) to 110F(43 C)

95°F - 110°F ✓



4) **Platinum Resistance Thermometer-**
From -200 C to 1200 C.

-200°C — 1200°C



$> 8000^{\circ}\text{C}$

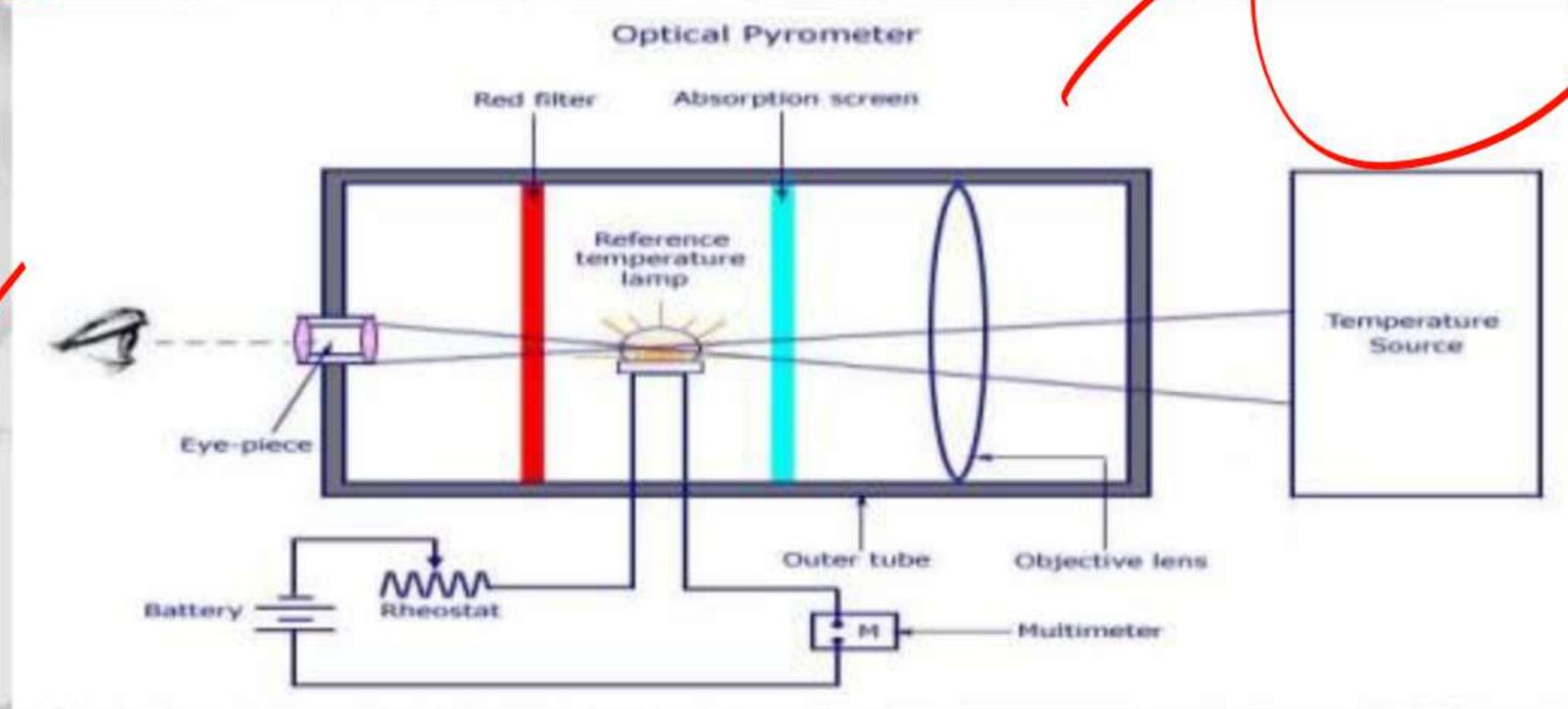
5) Total Radiation Pyrometer/ 5) टोटल रेडिएशन पाइरोमीटर--

-It can measure only Temperature greater than 8000C.

-Work on the principle of STEFAN'S LAW/ स्टीफन के नियम के सिद्धांत पर कार्य करें



Sun



TEMPERATURE SCALES

$^{\circ}C = ^{\circ}F = -40^{\circ}$

lower upper diff

273K, 492R, 0R

- ①
- ②
- ③
- ④
- ⑤

SCALE	L.F.P	U.F.P	F.I
Celcius	0 ^o C ✓	100 ^o C ✓	100
Fahrenheit	32 ^o F ✓	212 ^o F ✓	180
Kelvin	273K ✓	373K ✓	100
Rankin	492R _n ✓	672R _n ✓	180
Reaumur	0 ^o R ✓	80 ^o R ✓	80

$\frac{C}{100} = \frac{F-32}{180} = \frac{K-273}{100} = \frac{R-492}{180}$

$\frac{100}{180} = \frac{F-32}{180}$
 $180 + 32 = F$
 $212^{\circ}F$

$= \frac{F-32}{9}$
 $5(F-32)$