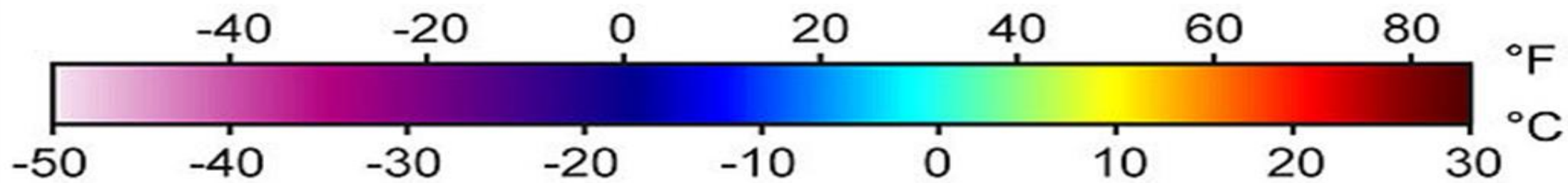
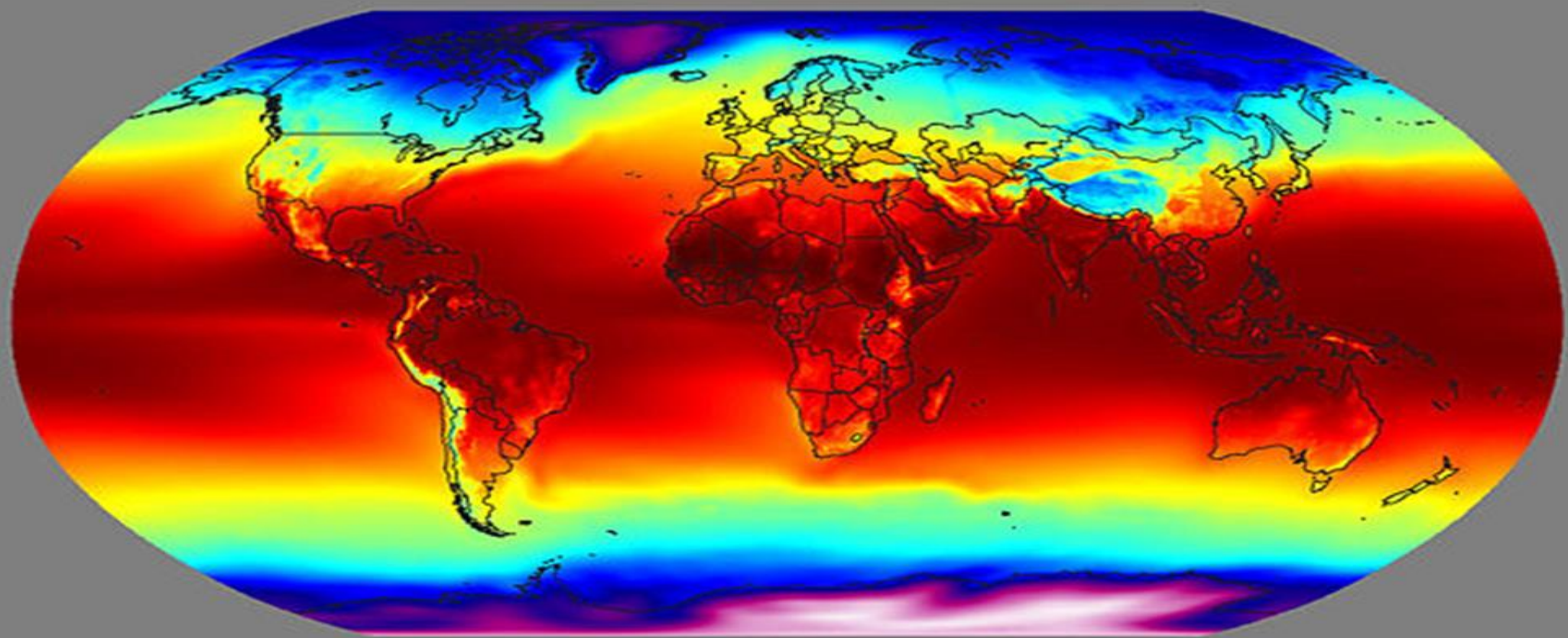


ECOLOGY LAB 3

Mohamed Sabbar

Temperature as an Ecological Factor

- **Temperature** is one of the essential and obvious changeable environmental factors. Temperature is a physical quantity expressing hot and cold. It's measured with a **thermometer** calibrated in one or more temperature scales. The most commonly used scales are the **Celsius** scale (formerly called centigrade) (**°C**), **Fahrenheit** scale (**°F**), and **Kelvin** scale (**K**). The kelvin is the unit of temperature in the **International System of Units** (abbreviated **SI**). The Kelvin scale is widely used in science and technology.



Annual Mean Temperature

Temperature as an Ecological Factor

- Temperature is a measurement of the degree of heat. Like light, heat is a form of energy. The radiant energy received from the sun is converted into heat energy. The temperature at which physiological processes are at their maximum efficiency is called optimum temperature.

Important of temperature as ecological factor

- Effect on cell and Protoplasm
- Effect on Metabolism
- Effect on Respiration
- Effect on Development
- Effect on Growth
- Effect on Transpiration in Plants
- Effect on Reproduction
- Effect on Sex ratio
- Effect on Morphology
- Effect of Coloration

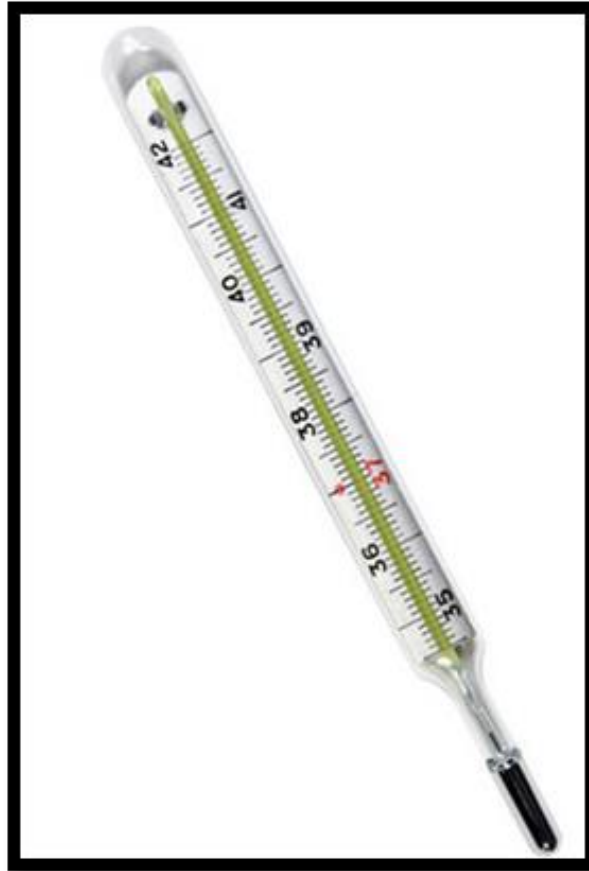
Temperature measurement method & devices

- Many methods have been developed for measuring temperature. Most of these rely on measuring some physical property of a working material that varies with temperature.

1- Thermometers

- Thermometers are well-known liquid expansion devices. They come in two main classifications: the mercury type and the organic, usually red, liquid type. The distinction between the two is notable, because mercury devices have certain limitations when it comes to how they can be safely transported or shipped.

Types of Thermometers



Temperature measurement method & devices

2- Bimetallic Devices

- bimetallic devices take advantage of the expansion of metals when they are heated. In these devices, two metals are bonded together and mechanically linked to a pointer. When heated, one side of the bimetallic strip will expand more than the other. In addition, when geared properly to a pointer, the temperature is indicated.

Types of Bimetallic Devices



Temperature measurement method & devices

3- Infrared Sensors

An infrared thermometer measures temperature by detecting the infrared energy emitted by all materials. The most basic design consists of a lens to focus the infrared (IR) energy on to a detector, which converts the energy to an electrical signal that can be displayed in units of temperature.

Types of Infrared Sensors



Sample measurement procedures for thermometers/thermistors

- A. Clean the probe end with de-ionized water and immerse into sample.
- B. If not measuring in-situ, swirl the instrument in the sample for mixing and equilibration.
- C. Allow the instrument to equilibrate with the sample for at least one minute.

Units

- Degrees Celsius (°C) or Degrees Fahrenheit (°F)
- Conversion Formulas:

$$^{\circ}\text{F} = (9/5 ^{\circ}\text{C}) + 32 \text{ or } ^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32)$$