Abiotic factors affecting organisms – revision notes

Science, Chemistry

Light Light intensity can be measured both physically measured for example with a LICOR light meter or a QSL (quantum scalar irradiance) meter. Luminous intensity can be measured subjectively measured with eg. a foot-candle meter, a type of photographic exposure meter. Intensity-watts rn-2 or einsteins m-2sec-1 Luminosity Units include candles, lumens, footcandles and lux.

Temperature Temperature is measured using a thermometer. It's also a measure of how fast the atoms and molecules of a substance are moving. The units of measure are degrees on the Fahrenheit, Celsius, and Kelvin scales.

Humidity Hygrometers may be designed for indoor or outdoor use (or both). Analog hygrometers use a moisture-sensitive material that is attached to a coil spring. The spring controls a needle on an easy-to-read circular dial. Analog hygrometers are often part of a durable, weather-resistant device that also includes a thermometer. Digital hygrometers determine the relative humidity by using a sensor to monitor an electric current that is affected by moisture levels.

Relative humidity, expressed as a percent. Salinity Salinity is often measured by measuring how well electricity travels through the water. This property of water is called conductivity. Water that has dissolved salt in it will conduct electricity better than water with no dissolved salt. Handheld Refractometer /Hydrometer /Conductivity Meter expressed in parts per million(ppm)

O2 concentration Pulse oximetry is a non-invasive method for monitoring a person's O2 saturation. Or Gas sensor used. pO2

CO2 concentration Use a sensor connected to a PC via an arduino board. pCO2

Wind Wind speed is now commonly measured with an anemometer but can also be classified using the older Beaufort scale which is based on people'sobservationof specifically definedwind effects. Knot

Factor– Light

Light is important to both animals and plants as it is the main source of living organisms energy on earth. It takes part in photosynthesis which provides energy to both animals and plants, required for growth, movement and survival. Plants need to grow to be used as afoodsource for animals. Light is also important for animals vision, without light we would not be able to see which would hamper movement and many senses. Humans also required sunlight for vitamin D. Light is also needed for warmth.

Factor– Temperature

Temperature is a major determining factor of global climate patterns. It affects the life cycles of plants and animals, influences weather and tides, and controls the freeze and thaw of the polar ice caps. A small change in average temperature can have powerful effects on theenvironmentworldwide and can determine if a certain species has a

suitable habitat for survival. Temperature also affects the rate of important reactions, it effects enzymes and many other chemicals and their efficiency.

Factor-Humidity

Humidity drives most of the observable weather phenomena starting with clouds via fog, rain to storms and finally to such dramatic weather phenomena as hurricanes. It is not possible to forecast the weather exactly without precise knowledge of humidity in all the layers of the atmosphere. Humidity affects chemical reactions, the environment of animals and plants.

Factor– Salinity

Ocean salinity plays key roles in the global hydrological cycle, ocean circulation and in regulating Earth's climate. Today's scientists know that Earth's water cycle is dominated by exchanges between the ocean and atmosphere, with sea surface salinity (SSS) varying because of freshwater input and output, via the processes of evaporation and precipitation.

Factor– O2 Concentration plant cells need oxygen to live, because without oxygen they can't perform aerobic respiration to produce co2 (respiration is the process of breaking down food to get energy). Similarly animals need o2 to respire and live, breath and produce energy. O2 concentration also effects habitats as different species require different levels of o2.

Factor– CO2 Concentration Without CO2 the life of photosynthetic organisms and animals would be impossible, given that CO2 provides the basis for the synthesis of organic compounds that provide nutrients for plants and

animals. We also know CO2 is toxic to humans therefore affects theirhealth. However plants need co2 for energy.

Factor-Wind

Wind effects seed dispersal and aids the production of pollen needed for pollination which is important because it leads to the production of fruits we can eat, and seeds that will create more plants. Wind also effects the moisture surrounding guard cells and the gas and water exchange in plants and animals.