**Corrodors+Edges** Boundaries (edges)between ecosystems and along prominent features within ecosystems have unique sets of physical condition ns and communities of species1

Edges become more extensive as habitat fragmentation increase, edge-adapted species may become more dominant2

Movement corridors may promote dispersal and help sustain population or they may promote harmful conditions such as diseases.3

**Alcohol and lactic Acid**

- Pyruvate is converted to ethanol in two steps
- Carbon dioxide is released from the pyruvate and forms acetaldehyde
- Acetaldehyde is reduced by NADH to ethanol
- Lactic Acid: Pyruvate is directly reduced by NADH to form lactate as an end product.
- No release of CO2; No acetaldehyde formed

**Fermentation+cellular Resp.**

Final electron acceptor is an organic pyruvate (lactic acid fermentation or acetaldehyde) (alcohol fermentation)

- Harvest less energy
- Yield 2 ATPs
- Anaerobic conditions
- Cellular: Final electron is Oxygen
- Harvest more energy
- Yield 38 ATPs
- Aerobic conditions

**parasitism, mutualism &commensalism**
**Parasitism:** a symbiotic relationship in which the parasite benefits at the expense of the host. **Mutualism:** a symbiotic relationship in which both participants benefit. **Commensalism:** a symbiotic relationship in which the symbiotic benefits but the host is neither helped nor harmed.

**Diploid**
Two sets of chromosomes per nucleus.
**Enthalpy**
The total potential energy of a system.
**Autotroph**
Produce its own organic food from inorganic substances
**Climax community**
Succession progress to a stable persistent community
**Ecotone**
Transition zone where two communities or biomes meet and integrate.
**Primosome**
A complex of proteins responsible for synthesizing the RNA primers required in DNA synthesis.
**Isomer**
Two or more chemical compound with the same chemical formula but different structural

**Acid and base**
Acid – proton (H+) donor, Base is proton acceptor.
**Kinetic and potential energy**
Kinetic energy- energy in motion, potential- to do work (stored energy).
**Phagocytosis and pinocytosis**
Phagocytosis – cell engulfs food particles.
Pinocytosis, cell engulfs liquid

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SIMILARITIES: **Prokaryotic** They both have DNA as their genetic material. They are both membrane bound. They both have ribosomes. They have similar basic metabolism. They are both amazingly diverse in forms.

DIFERENCES:
1. **Eukaryote**s have a nucleus, while prokaryotes do not
2. Eukaryotes have membrane-bound organelles, while prokaryotes do not.
3. Eukaryotic cells are, on average, ten times the size of prokaryotic cells.
4. The DNA of eukaryotes is much more complex and much more extensive than the DNA of prokaryotes.
5. Eukaryotes undergo mitosis; prokaryotes divide by binary fission. Cell type: E is multicellular and P unicellular.

**List the seven properties of life**

Cellular organization
Homeostasis
Metabolism
Responsiveness
Reproduction
Heredity
Growth

**What is an isotope?**) Isotopes are the atoms of an element that have the same number of protons but different amounts of neutrons. Radioisotopes are isotopes with unstable nucleus, which decays spontaneously releasing particles and energy – change number of protons – transform atom to atom of different element.

Often used as diagnostic tools in medicine – example kidney disorders are diagnosed by injecting small doses of radioactively-labelled substances into the blood and then analysing the tracer molecules excreted in the urine. PET scans for cancer tumours/cells.

Cells can use radioactive atoms just as they would use nonradioactive isotopes of the same elements. The radioactive isotopes are incorporated into biological active molecules, which are then used as tracers to track atoms during metabolism. Researchers measure radioactive decay in fossils to date these relics of past life

**Asexual and sexual reproduction**
In asexual reproduction, one parent produces genetically identical offspring.
Sexual reproduction is a type of reproduction in which two parents give rise to offspring that have unique combinations of genes inherited from the gametes of the two parents. Gametes are produced through meiosis.

**BUFFER**: A buffer is a substance that minimizes the changes in the concentrations of H+ and OH- in a solution. In living systems, for example human blood, buffering capacity of the blood prevents the swing s in PH. The normal pH of human blood is 7.4, which slightly basic. If the pH increases to more than the normal one, the buffer works by accepting H+ from the solution when they are in excess and donating H+ to the solution when they have been lacking.

**Explain how enzyme activity can be regulated or controlled by environmental factors, substrate concentration co-factors and enzyme inhibitors**
The velocity of an enzymatic reaction will increase with temperature because the substrate collides with active sites more frequently. Beyond the optimum temperature the speed of an enzymatic reaction will drop sharply. The same hold true for PH
The more substrate molecule available the more frequently they access the active sites of the enzymes. However, there is a limit to how fast the reaction can be pushed by adding more substrate to a fixed concentration of enzyme and the velocity of the reaction will stabilize if all the active sites are engaged.
Cofactors can be inorganic or organic (called co-enzymes) that bound to the active site to assist the enzyme. Enzyme inhibitors are usually chemicals that inhibit the enzyme reaction by binding to the active site. It is usually irreversible if the inhibitor bind covalently to the site by it may be reversible if the bond is weak.

**5 LIVING ORGANISMS:**
**Organisms are composed of cells.**
**Living organisms grow and develop.**
**Metabolism.**
**Response to stimuli.**
**Reproduction.**
Living things are made of cells.
Living things obtain and use energy.
Living things grow and develop.
Living things reproduce.
Living things respond to their environment

**four polysaccharides**
**STARCH:** Structure: Is formed by glucose monomers joined by 1-4 linkages. Function: When starch is broken down the available glucose serve as nutrient for animal cells (including humans)

**GLYCOGE**N: Structure: It is formed by polymers of glucose which form large number of branches.

Function: When hydrolysed the glycogen releases glucose when the sugar demand increases.

**CELLULOSE:** Structure: Is a polymer formed by the glucose in the β configuration making every glucose upside down with respect to next joined ones.
Function: Major component of the plant cell wall. Building material for plants.

**CHITLIN**: Structure: The structure is like cellulose except that chitin has a nitrogen – containing appendages in its glucose monomer.
Functions: The exoskeleton of arthropods, (insects, spiders, crustaceans and related animals are composed of chitin. In fungi, it is used as the building material for their cell walls.

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| Plant cell | Animal cell |
|---|---|
| Consists of cell wall | No cell wall |
| Regular fixed shape | Irregular |
| Large central vacuole and tonoplast | If present small vacuole |
| Chloroplast present | Absent |
| No lysosomes | Present |
| No centrosomes | Present |

**cell structure+ functions**
It is the control centre of the cell
**Nucleus**
It encloses cellular contents and regulates movement of material in and out of the cell
**Plasma membrane**
It stores materials, waste and water, and maintains hydrostatic pressure
**Vacuole**
**It is the site of lipid synthesis**
**Smooth endoplasmic reticulum**
It enables photosynthesis
**Chloroplast**

**Describe the structure and function of ribosomes.** Ribosomes are made of two types of subunits – large and small subunits. *The ribosomal subunits are made up of proteins and RNA molecules are called ribosomal RNA, or rRNA. ******** The ribosomal subunits are made in the nucleolus. ******

The subunits are then transported via the nuclear pores to the cytoplasm. ******Approximately two-thirds of the mass of a ribosome is rRNA. ******The ribosomes of eukaryotes are slightly larger than those of prokaryotes. ******Ribosomes play a role in the formation of polypeptides

**Predation**: The interaction in which a predator eats another animal. **Herbivory**: The interaction in which an herbivore eats a plant. **Parasitism**: A symbiotic relationship in which the parasite benefits at the expense of the host.

**Greenhouse effect.** CO2, water vapour, sulphur dioxide and other greenhouse gases in the atmosphere intercept and absorb radiant energy emitted by the earth and reflect it back towards the earth. This process causes some of the solar energy to be retained. The greenhouse effect is believed to have contributed to the present global warming.

**List the four major threats to biodiversity and give an example of each**. - **HABITAT LOSS**: Human activities such as agriculture, urban development, forestry, mining, etc., can also lead to habit loss. **INTRODUCED SPECIES**: Introduction of exotic species, are those that humans move intentionally or accidently from the species, native locations to new geographic regions.

**OVERHARVESTING:** Overharvested organisms such as seabirds, elephants, whales, rhinoceroses, and fish are in the danger of extinction because of overharvesting. **GLOBAL CHANGE:** The final threat to biodiversity is global change which changes the fabric of Earth's ecosystems at regional to global scales. Global change includes climate, atmospheric chemistry, and broad ecological systems that reduce the capacity of Earth to sustain life.

| Mitosis | Meiosis |
|---|---|
| DNA replication occurs during interphase before mitosis begins | DNA replication occurs during interphase before meiosis 1 begins |
| One division | Two divisions |
| Synapsis does not occur | Synapsis occurs during prophase 1 |
| Two daughter cells, each 2n and genetically identical to parent cell | Four haploid cells, each containing half as many chromosomes as the parent cell |
| Effects growth and repair | Produces gametes |

**In animal cells**, cytokinesis occurs by a process known as cleavage. The first sign of cleavage begins with the appearance of a cleavage furrow near the metaphase plate, which deepens until the parent cell is split in two.

**Plant cells** have cell walls and form no cleavage furrow. Vesicles from the Golgi apparatus collect at the metaphase plate. The vesicles fuse with each other to form the cell plate. The cell plate grows to fuse with the plasma-membrane.

**Distinguish between autotrophs and heterotrophs:** Autotrophs are organisms that are able to manufacture their food. They use CO2 a source of Carbon. *****Heterotrophs depend on other organisms for food. They use organic compound as source of Carbon.

**How is the accumulation of chlorofluorocarbons responsible for depleting the atmospheric zone**?
When breakdown products of the chlorofluorocarbons rise to the stratosphere, the chlorine they contained reacts with the ozone reducing it to O2. Subsequent chemical reactions liberate the chlorine allowing it to react with other ozone molecules in a catalytic chain reaction.