Lesson Plan 1: Inter-relatedness between all living organisms on earth, with a focus on humans

This section highlights the cellular and molecular commonalities between different life forms on earth, and how human life is interlinked with other forms of life.

Time: 30 minutes

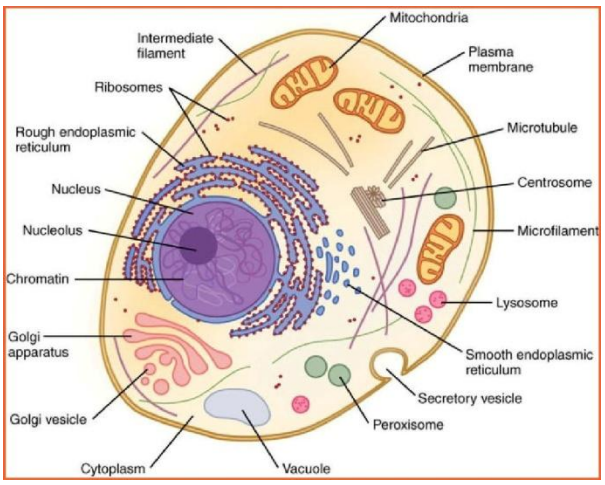
Requirements:
Computer and an internet connection (for YouTube videos)
Screen and projector
Activity sheets
Flipchart (if possible) or a blackboard

Activity:
Facilitator: Let's understand our neighbours on earth in this session. Can you name some of the living things that live around us? Ask each child to come up with one life form, and write those on the blackboard. Now tell me what is common between all the living things whose names you see up here on the board?

Expected answer: They are all made up of cells and they all live on the earth.

The following exercise is to reinforce the common features of living cells.

Facilitator: Let's start with what a cell means. (Draw a circle and call students to come and draw different parts of a generic cell including the plasma membrane, cytoplasm, and its organelles – nucleus, mitochondria, etc.).



But does every cell look like this? (Show a slide that shows different kinds of cells - eye cells, ear cells etc.). No, different cells look and behave differently depending on their functions. An eye cell, for example, will need to have the machinery to detect light, whereas the ear cells need to be able to detect sound. Cells can get their specialized functions because of their structure, for example Red Blood Cells have a biconcave shape to maximize oxygen transport in the blood. On the other hand, cells can also perform special functions owing to special machines they have. Do you know what these machines in cells are? Most of them are proteins. It so turns out that different cells produce different proteins. But how does a cell know how to produce these specific machines? What all will it need to be able to produce them? For this, the cell needs to have a blueprint of the design of the protein. Where are they going to get this blueprint from? It also so happens that the codes for these designs are passed on from parents to children in all living things. How? In the form of very small structures called genes, which are made of thread like structures called DNA. Because in a family we share DNA, our proteins or the machines in our cells are alike - and hence in many ways we are like our parents. This is true for us, for a cow, even for the tiny living things called the micro-organisms.

The following video and the intended follow-up discussion is to understand the dynamics of living things living together.

Facilitator: We can happily live in non-overlapping space. But when we share the same space then something like this happens. Play a Tom and Jerry cartoon

Facilitator: Why are these guys fighting? Initiate a discussion.

Expected points to be covered: We want to get resources like food for ourselves – and often they are limited. So we fight to get what we want, and that is at the expense of our competitors. Our competitors also act similarly – and basically we and our competitors are constantly thinking and revising our strategies of how to get the best for ourselves.

Facilitator: Take 3 mins and think of any two living things on the board and tell us about the respective strategies that these organisms have come up with for their benefit. Do we always need to fight for our benefit? We could be friends with someone to get their help or compete against someone so that you don't have to share your resources with them. The group activity sheet (Know thy Neighbours) will look like this:

Know thy Neighbours!	
Pick two living things	
Living thing 1	Living thing 2
Are they friends with each other	Yes / No / Can't say
Why do you say so?	

(The facilitators go around and see how well the students are working on it, and guide them when needed.) Discuss all the answers in the class to get an idea of how prevalent competition is all around us. Write them on the flipchart/ blackboard during the discussion.

Quickly go through some of the competitive strategies that students had already talked about and have a few examples covering symbiosis and parasitism on a slide for discussion.

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