

FUNDAMENTALS OF BIOLOGY

STUDY OF LIVING ORGANISMS

Class 9th

Living organisms are bundles of cells that carry out specialized functions

Scope of Biology

Ecology

(Relation with environment)

Physiology
(Life Processes)

Palaeontology
(Fossils)

Genetics

(Inheritance)

Cytology (Cells)
Histology
(Tissues)

Embryology (Development)

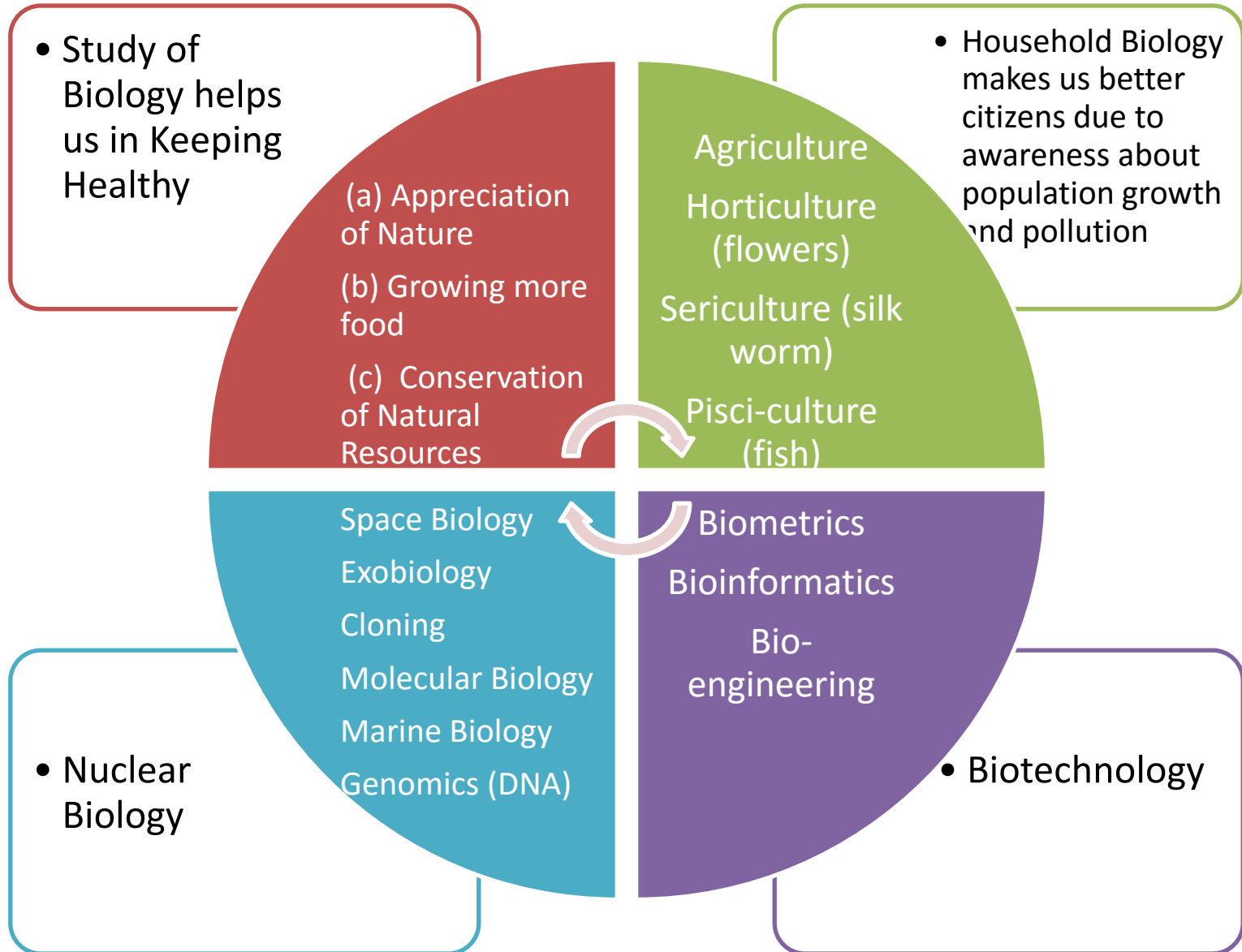
Anatomy

(Gross structure)

Morphology
(Interpretation of structure)

Parasitology
(Parasites)

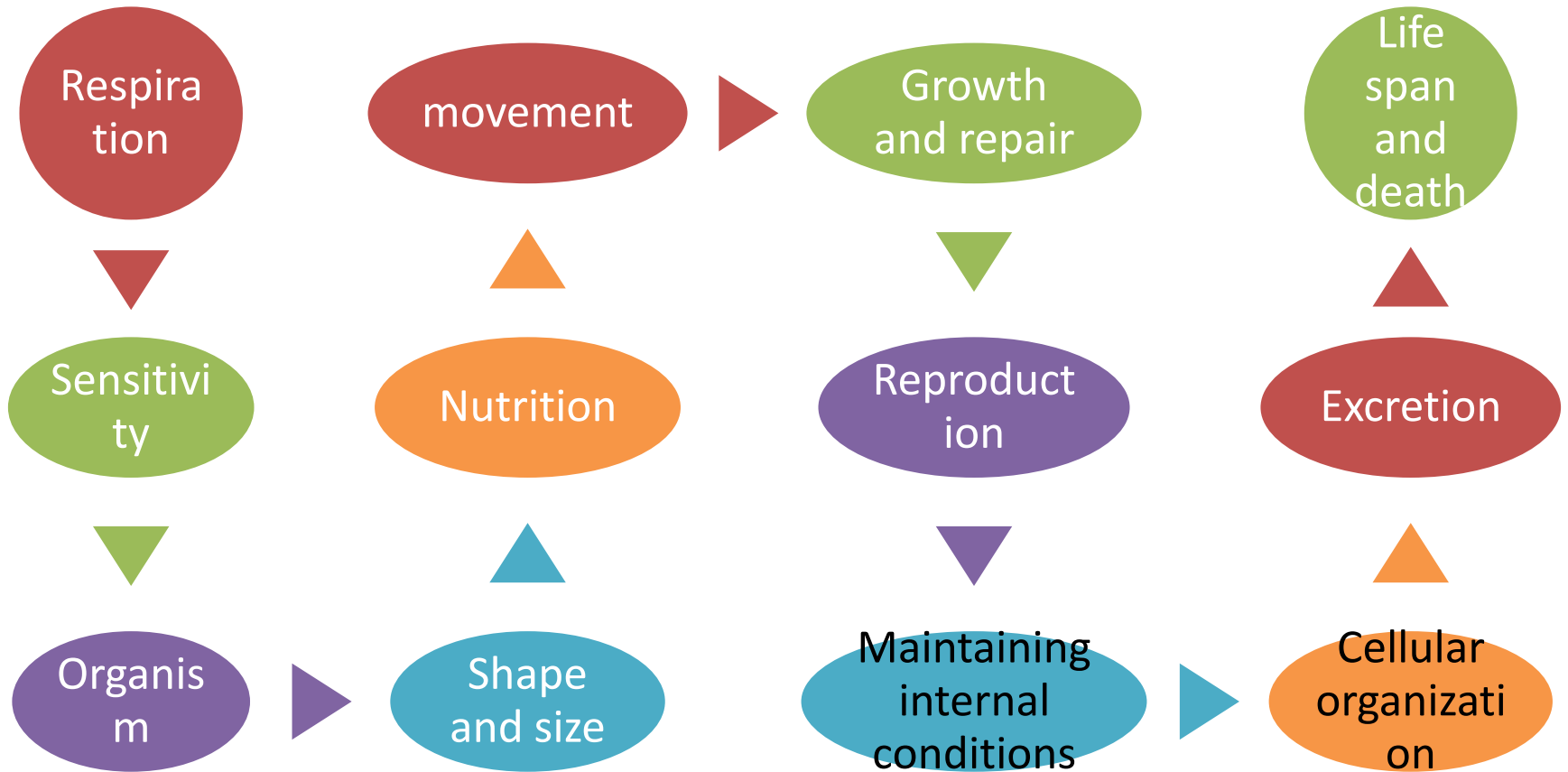
Applied Biology



Matching branches of Biology with area of study

No.	Branch	Area of study
1.	Ecology	Environment
2.	Pathology	Diseases
3	Palaeontology	Fossils
4	Ornithology	Birds
5	Ichthyology	Fishes
6	Herpetology	Snakes
7	Cytology	Cells
8	Virology	Viruses

Characteristics of living organism



Growth in Living Organisms

Internal Growth

- Cellular organisation is internal
- Cells increase in size and number to cause internal growth

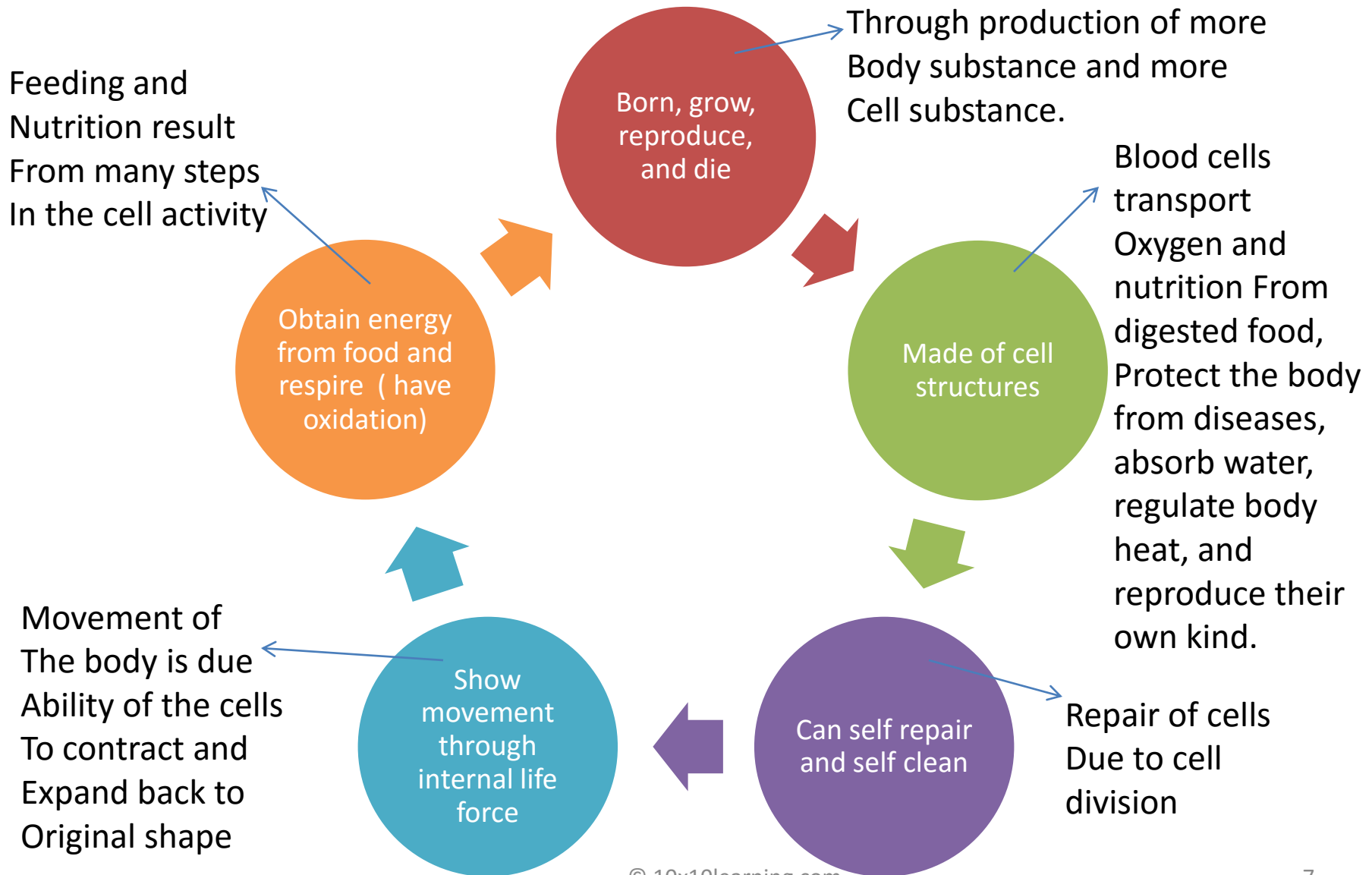
Differential Growth

- Substances in food causes different parts of the body to grow in different proportions
- Food is converted into protoplasm to enable cells to absorb it easily

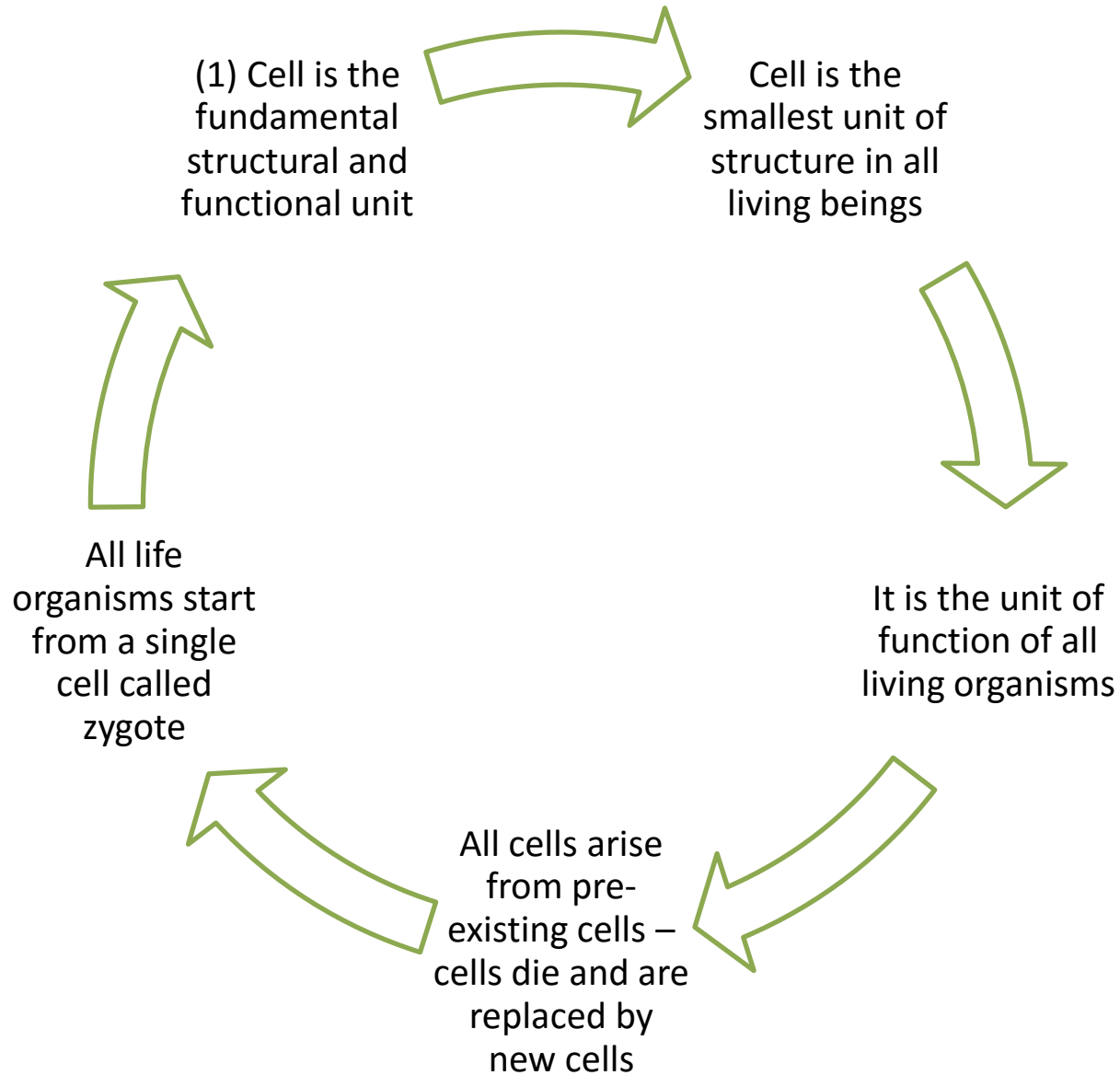
Growth is Irreversible

- Growth in living organism cannot be reversed.
- The movement of growth is always forward and never backward.

Living organisms are bundles of cells carrying out specialized functions



A Living Cell – The basic unit of life



Range and variety of Cells

Smallest cells

Bacteria
(0.3 to 0.5 micrometre)

Red Blood Cell in Humans
(about 7 mm)

Longest cells

Nerve cells in humans – from different parts of body to the spine

Size of cell as a unit gives it great efficiency in functioning

Largest Cells

The yellow sphere in the bird's eggs

Egg of an Ostrich is the largest single living cell in the world.

Structure of a living Cell

(a)Nucleus, (b)Cell Membrane, (c)Cytoplasm, with Cell Organelles (little organs) that are the living part, and give the cell its shape, structure, and a definite function.

(a) Cell Nucleus : Membrane, Nucleoli, an chromatin fibres. The membrane is semi permeable and has fine pores. It is made up of Lipoprotein. It regulates entry and maintains shape.

(b) Cell Membrane is the plasma membrane in humans and animals In Plants , in addition to the membrane, there is a thicker outer covering called the Cell Wall.

(c) **Cytoplasm** is a colourless , transparent, semi-liquid substance , that is always in a state of movement. Excluding the nucleus it has all organelles.

Many chemical reactions take place in the cytoplasm, such as synthesis of proteins by ribosome , respiration, secretion of enzymes, hormones , digestion

(d) **Protoplasm** , includes Cytoplasm and the Nucleus , and is the total substance of a living cell.

Membrane has fine pores through which substances are exchanged

- Nucleus regulates and coordinates various processes of the cell.
- It has an important role in division of cell.
- Nucleus determines heredity through genes.

Types of Cell

1) Prokaryotic cell

contain a single length of DNA;

- Small ribosomes;
- No other cell Organelles
- No well defined nucleus

Examples : bacteria, blue-green algae.

2) Eukaryotic cell

- Have a well defined Nucleus
- Several DNA strands that are wound around some proteins;
- Larger Ribosomes
- Several organelles

Examples : amoeba, all plant cells, all animal cells.

Thank you

