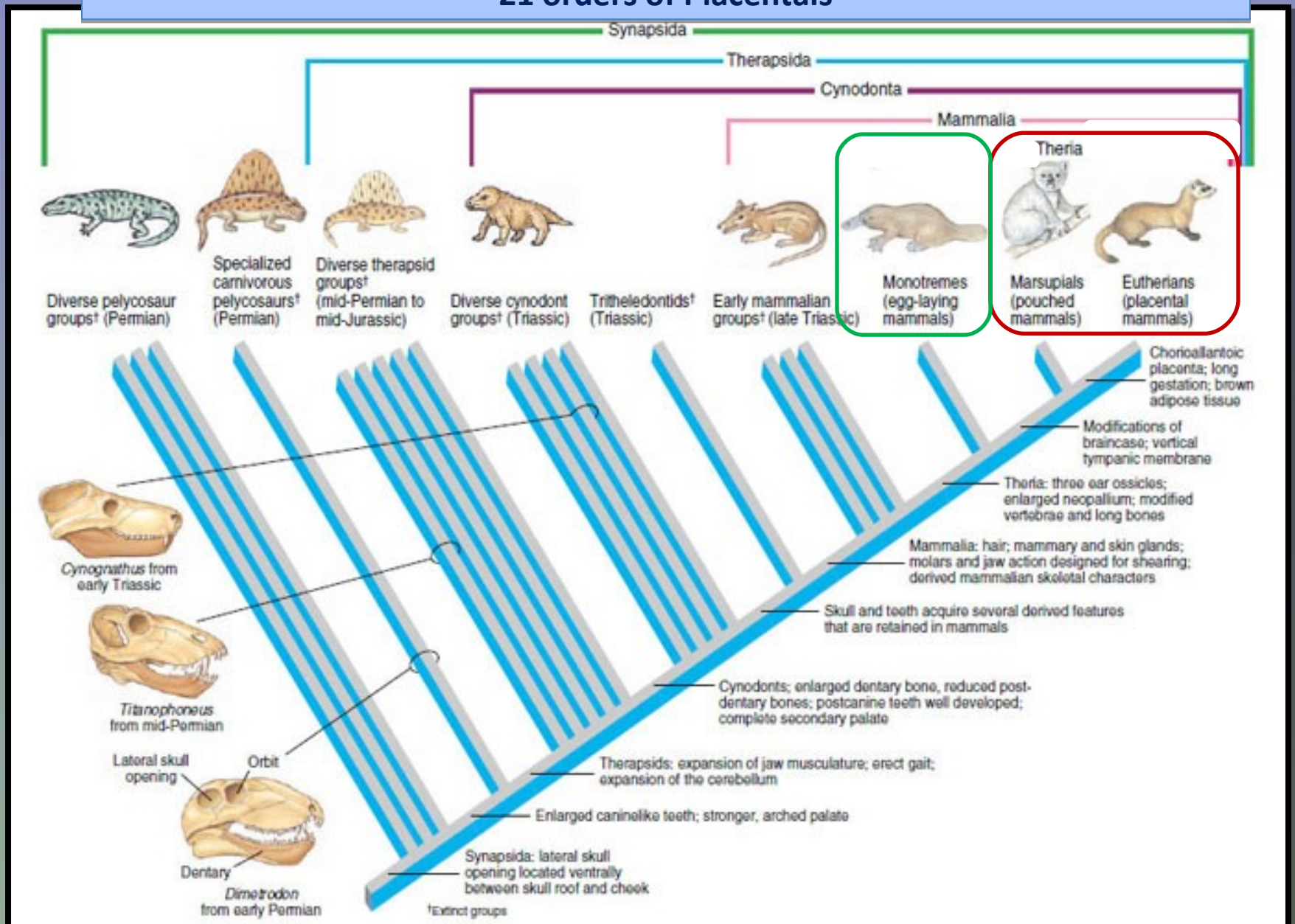
CLASS: MAMMALIA (MAMMALS)

SUBCLASS: PROTETHERIA

SUBCLASS: THERIA

Living mammals are divided into two clades: **Monotremes & Therians**

Living Mammals: 29 order; 1 order of Monotremes; 7 orders of Marsupials; 21 orders of Placentals



STRUCTURAL DIFFERENCES BETWEEN MAMMALS AND REPTILES

1. Body covers with hair in mammals; Body covers with scale in Reptiles
2. Mammal's skull has got two occipital condyle; Repile's skull has got one occipital condyle.
3. There is a muscular diaphragm that separates the chest cavity from the abdominal cavity in mammals.
4. The lower jaw of mammals is one piece whereas it consists of several pieces in Reptiles.
5. The lower jaw bones directly with the skull in mammals, while it makes a joint with quadratum in reptiles.

6. There are three bones (incus, malleus and stapes) in the middle ear in mammals. There is only one bone (stapes), in the middle ear in reptiles.
7. Mammals have diphyodont teeth; teeth heterodont in most
8. The heart is four chambers and has got only left aortic root in Mammals. The heart is 3-4 chambers in Reptiles
9. In mammals, the larynx (sound box) is well developed.
10. Mammals feed their offspring with the milk they secrete.

Characters Indicating that Mammals are More Developed Animals than Birds

Their body is covered with **hair**

Young nourished by milk from **mammary gland**

Cerebral cortex well developed

Well-developed sound, hearing and vision organs

Nonnucleated, biconcave red blood cells

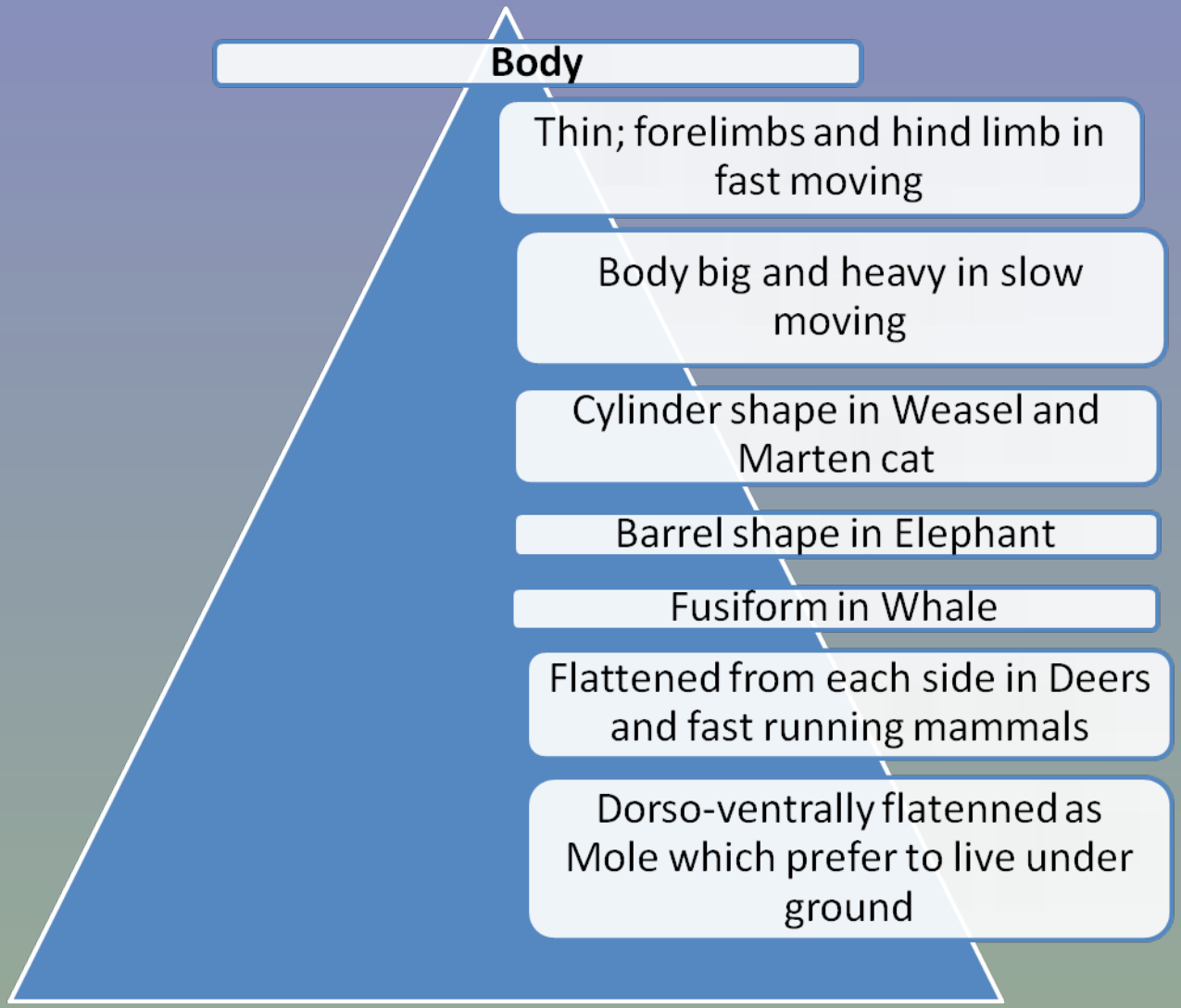
Memory formation

Allows learning and keeping them in mind

CHARACTERISTICS OF CLASS MAMMALIA

- Fleshy external ears
- Body mainly covered with hair
- Sweat, scent, sebaceous glands are present
- Skulls with two occipital condyles
- Lower jaw has a single enlarged bone
- Seven cervical vertebrae and pelvic bones fused
- Brain is highly developed
- Middle ear with three bones (mallcus, incus, scapes)
- Breathe through lungs; Larynx present
- Endothermic; red blood cells are non-nucleated
- Metanephric kidneys; Nitrogenous waste is usually urea
- Seperate sexes; Internal fertilization ; mainly viviparous

MORPHOLOGY


Body
Thin; forelimbs and hind limb in fast moving
Body big and heavy in slow moving
Cylinder shape in Weasel and Marten cat
Barrel shape in Elephant
Fusiform in Whale
Flattened from each side in Deers and fast running mammals
Dorso-ventrally flatenned as Mole which prefer to live under ground

SKELETON SYSTEM

Reduced bone number compared to other vertebrates

Changes are observed in fore and hind legs depending on the way of life in mammals.

Fast moving mammals, legs are long and thin

Slow moving mammals (Elephant), legs are very thick.

MUSCULAR SYSTEM AN MOVEMENT-LOCOMATION

Metameric array in the abdominal muscles is not very clear

The muscles in the head, neck and extremities are thinner and more developed.

Face muscles in mammals are well developed and give some facial expression to any event

REPRODUCTIVE SYSTEM

Separate sexes

Internal fertilization

- Copulary organ a penisare present in males.

Testis are present usually in **Scrotum** sac.

- **Monotremes** are egg-laying (oviparous) mammals.
- **Monotremes have got cloaca**
- The duck-billed platypus has one breeding season each year
- Usually two ovulated eggs are fertilized in the oviduct.
- Embryos developed in the uterus for 10-12 days
- A thin leathery shell is secreted around the embryos before the eggs are laid.
- Echidnas incubate their eggs in an abdominal pouch.
- After hatching, young feed on milk produced by the mother's mammary glands.
- Monotremes have no nipples, young lap milk secreted onto the belly of the mother

- **Marsupials** are pouched, viviparous mammals.
- They have a transient type of placenta called **Choriovitelline (yolk sac) placenta.**
- At first, an embryo encapsulated by shell membranes and floats free for several days in the uterine fluid.
- After hatching embryos, of most marsupials do not implant
- Gestation (the intrauterine period of development) is short
- Birth to tiny young (in this period they are still embryos).
- Followed by a prolonged interval of lactation and parental care

- Most of them breed in spring and winter.
- Although many male mammals are fertile at any time, female mammals fertility is restricted to a specific time during a periodical cycle (estrous cycle).
- Females copulate with males only a relatively brief period in this cycle, called **heat** or **estrus**
- Animals that have only one estrus during their breeding season are called **monestrous (dogs, foxes, bats, etc.)**
- Animals that have a recurrence of estrus during breeding season are called **polystreous (Mice, Squirrel)**
- **Pregnancy period in mammals is generally proportional to size**
- **The number of young produced in a birth is inversely proportional to the size of the body.**