

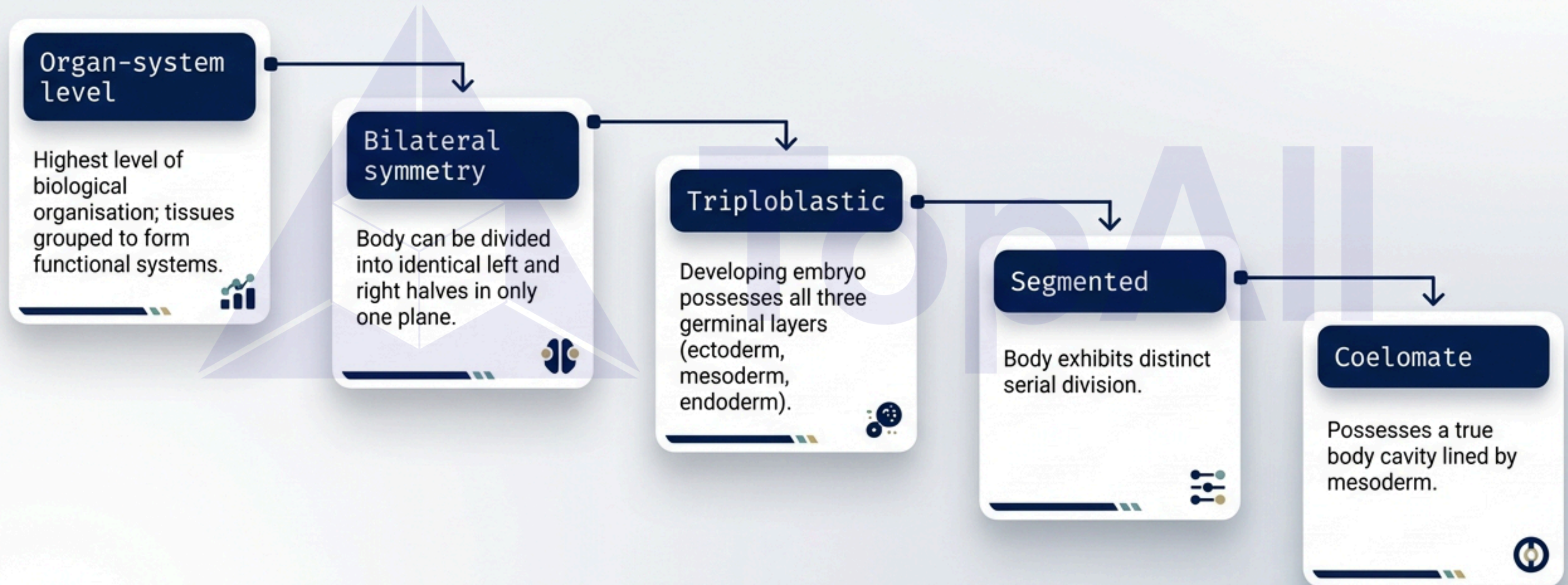
The Largest Animal Phylum



Planetary Dominance

Over two-thirds (66%+) of all named animal species on Earth belong to a single phylum: Arthropoda.

Taxonomic Foundation & Body Plan



The Morphological Blueprint

Head

(Sensory & feeding hub)

Chitinous Exoskeleton – A tough, protective outer armor covering the entire body.

Abdomen

(Visceral & reproductive core)

What's in a name?

arthros + poda = Jointed Appendages
(joint) (appendages)

This evolutionary innovation provides extreme mobility despite a rigid exoskeleton.



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Life Support: Circulation & Respiration

Circulation

Open-Type System

Blood is pumped out of the heart into open spaces (hemocoels); cells and tissues are directly bathed in it, rather than being confined to a closed network of vessels.

Respiratory Diversity

Highly adaptable breathing mechanisms based on habitat.

Gills
(Aquatic)

Book gills
(Marine/Primitive)

Book lungs
(Terrestrial arachnids)

Tracheal system
(Insects)

Environmental Interface: Sensory & Excretion

Excretory System

Malpighian
tubules

The specialized excretory organs responsible for removing metabolic waste and maintaining osmoregulation within the open circulatory system.

Antennae

Chemoreception and
tactile feedback.

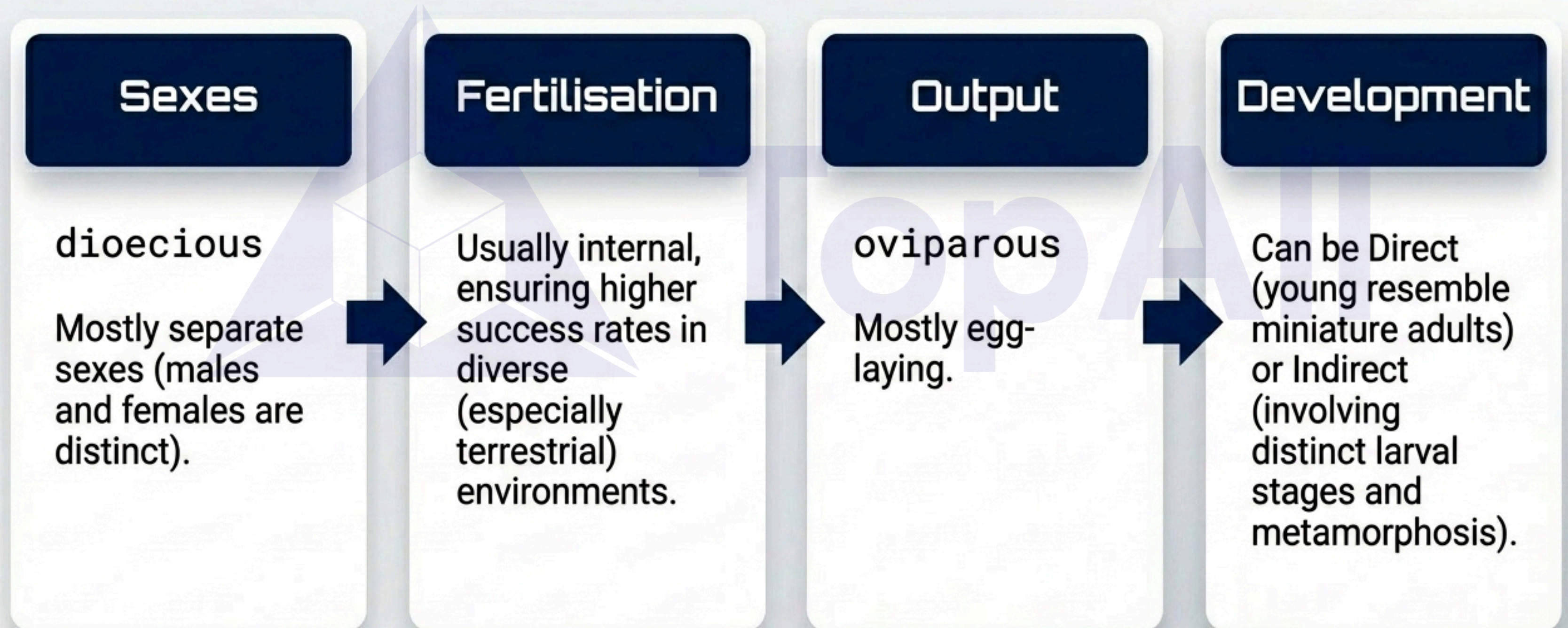
Eyes

Diverse visual processing,
featuring both simple and
highly complex compound
structures.

Balancing Organs

Statocysts - specialized
sensory receptors
providing feedback on
orientation and balance.

Reproduction & Development



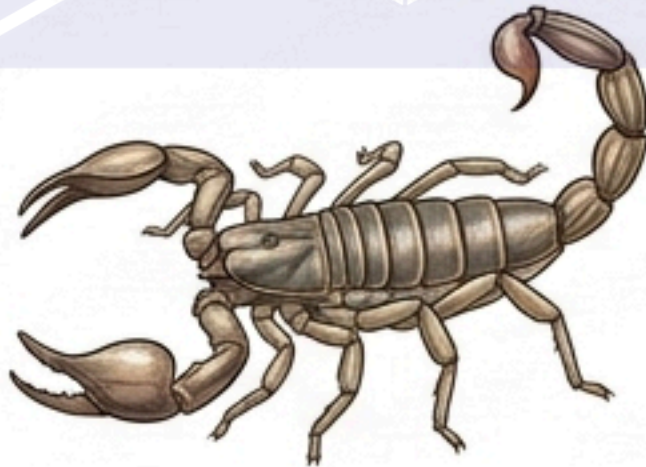
Diversity in Form (Figure 4.12)



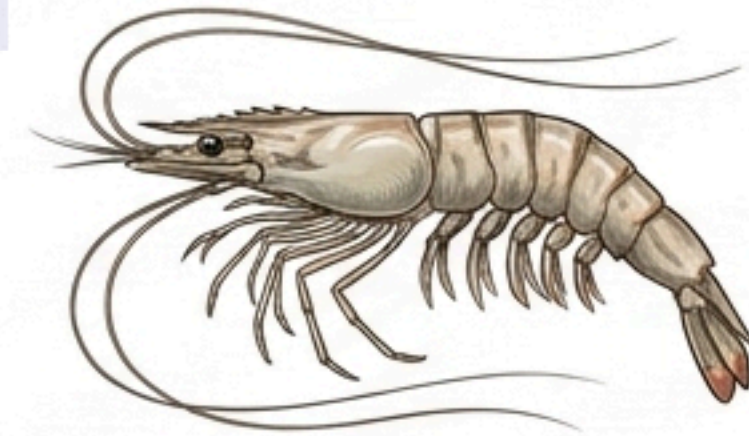
(a) Locust (Showcasing insecta anatomy)



(b) Butterfly (Showcasing scaled wings and indirect development outcomes)



(c) Scorpion (Showcasing arachnid body plan)



(d) Prawn (Showcasing aquatic adaptations and antennae)

Ecological & Economic Impact Matrix

Economic Drivers

Beneficial insects providing commercial value.

Apis (Honey bee)

Bombyx (Silkworm)

Laccifer (Lac insect)

Disease Vectors

Transmitters of pathogens.

Anopheles (Mosquito)

Culex (Mosquito)

Aedes (Mosquito)

Gregarious Pests

Swarming agricultural threats.

Locusta (Locust)

Evolutionary Survivors

Living Fossils - ancient morphology preserved.

Limulus (King crab)



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