Trends in Animal Evolution

Animal Characteristics
- multi-cellular
- eukaryotic
- heterotrophic
- internal digesters
- cells lack cell walls

Evolutionary Trends
- Throughout our study of the animal kingdom, you should be watching for evolutionary trends.
- We will focus on 4 in particular.

1. Increasing Complexity
- In simple organisms, each cell takes care of itself (feeding, gas exchange, waste removal etc.)
- In more complex organisms, specialized cells carry out different tasks for the organism.
- This is referred to as the division of labour.
- Without the division of labour, organisms could not grow very large, as they would rely on diffusion and osmosis for obtaining nutrients and oxygen and removing wastes.

Levels of Organization
- Essential life functions of simple animals are carried out on the cellular or tissue level.
- More complex animals have more specialized tissues and more specialized organs and organ systems.

2. Symmetry
Asymmetry
- Simple animals are ASYMMETRICAL â€” they have no regular arrangement.
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- Example: the sponges

Radial Symmetry
- More complex organisms show RADIAL SYMMETRY à body parts repeat around a center point.
- Example: starfish, jellyfish and anenomes.

Bilateral Symmetry
- The most complex organisms show BILATERAL SYMMETRY à have a front and back, a top and bottom and the two sides are mirror images of each other.
- Examples: humans, crayfish, insects.

3. Cephalization
- More complex organisms have a concentration of sense organs and nerve cells located in their anterior (head) end.
- This is referred to as CEPHALIZATION.

4. Development of a Coelom
- A COELOM is a body cavity completely lined with MESODERM (a third layer of cells).
- A lined coelom allows more complex animals to develop a more specialized digestive system.