

## 11-1 Animal Definition p.374

The variety of life within in Animal Kingdom is huge: fleas and mites to whales and everything in between

Zoology—the branch of biology that studies animals

- > entomology— study of insects
- > ichthyology— study of fishes
- > ornithology— study of birds
- > herpetology— study of reptiles/amphibians
- > mammalogy— study of mammals
- > malacology— study of mollusk
- > carcinology— study of crustaceans
- > helminthology— study of “worms”

\*\*\*characteristics all animals share

1. animals are multicellular and cells are arranged into tissues that perform specific function
2. Animal cells are *eukaryotic*: have a nucleus s and various other organelles
3. Animals must rely on other organisms for food (consumers)
4. Animals digest their food so that proteins, “carbs”, and fats are broken down into small enough molecules for the cell to use
5. Most animals are mobile; those that aren’t have adaptations that allow them to feed, reproduce, and protect themselves while in place
6. Animals are capable of sexual reproduction (offspring with “mixed” DNA) and some can also reproduce asexually

## How animals meet needs

Adaptations—any structure, process, or behavior that helps an organism survival in its environment

—> adaptations are inherited, and as environment change, so do the adaptations that are beneficial

Adaptations include can can be a “blend” of:

- Obtaining energy
- Physical (body)
- Predator
- Behavioral

## Obtaining energy

Animals have meaning of objecting, eating, and digesting different foods

—> animals are either:

- Herbivores— plant eaters
- Carnivores— animals eaters
- Omnivore— plant AND animals eaters
- Derivers— tiny bits of de saying matter

Animals **dentition**—the arrangement and condition of the teeth do an individual, is an adaption to what the species eat (p.430)

—> herbivores molars are hard and flat for grinding, carnivore teeth are sharp and jagged for puncturing, cutting, and shredding

(AC)

Animals usually have an **Alimentary canal**—which is the pathway food enters the body, is digested, and leaves the body (p.432)

—> herbivores AC's are typically longer than carnivores' because it takes the body longer to break down *cellulose* in plant cell walls

## **Physical adaptations**

Physical adaptations have to do with an animals body and the animals protection because of its:

—> size (being large means less attack: think moose and hippos)

—> outer coverings such as shells or quills (porcupine needles)

—> **mimicry**—an adaptation in which one animal closely resembles another in appearance or behavior (think flies with yellow/black bands on thorax like bees)

**camouflage**—any marking or colorings that helps animals hide from others (almost always has to do with being unrecognizable in surroundings)

**Predator Adaptations** enable an animal to more easily capture its prey, usually as a surprise or with minimal detection

- camouflage and coloration (tiger stripes, killer whales)
- "stalking" and chasing: being able to move in close while undetected, endurance for chases
- heightens senses: eagle eyes, sharks' smell, coyote hearing

**Behavioral Adaptations** have to do with what an animal does to survive...Examples:

- chemicals: skunk spray, octopus ink
- speed: ability to outrun predators
- herds and packs: helps prey against predators AND predators against prey...

Many animals are adapted to their environment via a "blend" of these categories. Example:spinnners weave webs (behavioral) to capture food (predator) "obtaining energy" adaptations.....

## **Animal Classification p.393**

Animals are classified(grouped) based on similarities in features and characteristics

**Chordates** are animals with **spinal chords**—bundle of nerve that is connected to the Braun and carries messages to all parts of the body

**Vertebrates**—animals with backbones

—>backbones are made up of stacked "vertebrae" that support the animals and protects the spinal chord

**Invertebrates**—animal without backbones

—>make up 95-97% of known animal species

Another characteristic scientist look at for animals is symmetry, or how the animal's body part are arranged (how it's shaped) p.377:

Animals that have no definite shape are asymmetrical

Radial symmetry is when an animal has body parts arranged in a circle around a center point

—>it can be divided into many nearly identical halves, like sea urchins, jellyfish

—>only exists in water animals that are stationary, move with water, or move up and down; allows the to sense their environment from all sides

Bilateral symmetry means an animal can be divided into only 2 nearly identical halves (it has a right and left side)

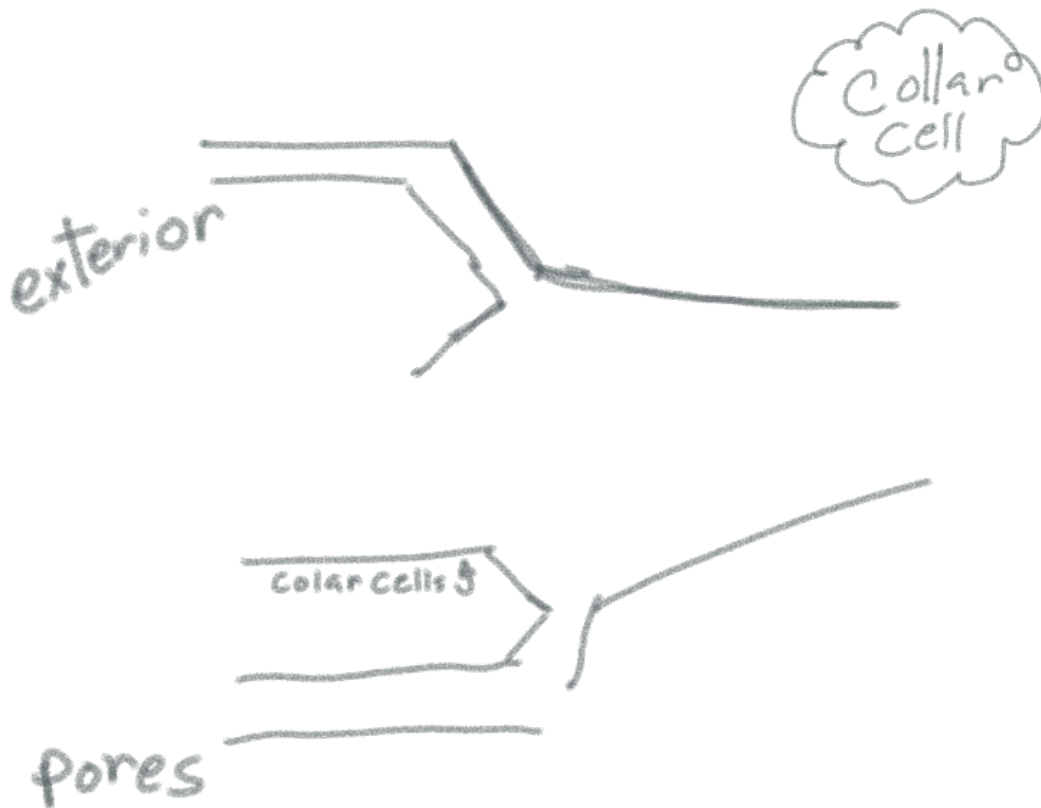
—> all land animals have bilateral symmetry

## Sponges and Cnidarians

Sponges and animals in the phylum *porifera* (5,000 sp.) which means “pore bearer” —> this is appropriate because sponges’ bodies are full of pores and channels for water circulation

Sponges were previously classified in the *plant kingdom* because they are:

Sessile— attached to one place during their lifetime



—> scientists changed the classification to Animals when microscope technology advanced to where it was discovered sponges can't make their own food (are consumers)

## Porifera, cont'd

All sponges live in water, most shallow salt water, some in freshwater rivers lakes and streams

Very greatly in size shape and color: some are radically asymmetric

Often found growing with others in “colonies” and are important as food for some snails

## **Porifera bodies**

Sponges are hollow plants tubes that are closed at the bottom but open at the top

—> have many pores and channels that connect the inside of the tube to the water outside

They have no tissues, organs, or organ systems, but they do have some specialized cells:

—> **collar cells**—line the inside of the sponge and have flagella which to move water through the sponge

—> **spicules**—not cells, but in many sponges are sharp pointed structures that provide support and protection for sponges

\*Test question\* (matching)

Sponges=A (porifera)

## **Porifera life**

**Food:** eat by drawing water inside through their pores. Microscopic food particles and oxygen are filtered out of the water and the filtered water with waste leaves through the top

**Reproduction:** asexually by budding or regenerating; sexually, but sponges are **hermaphrodites**—are (non gendered) each producers both Sperm and eggs but cannot fertilize their own egg

—> fertilized eggs become “larvae” that have cilia/flagella to help them swim until they settle down somewhere to grown into adults

## **Cnidarians**

*Phylum cnidaria* (100,00 sp.) are all aquatic animals (nearly all marine) and include corals, anemones, hydras, and jellyfishes (hydras are basically freshwater versions of the sea anemones)

—> the distinguishing characteristics of cnidarians are **stinging cells**—(are called **cnidocytes**) that are used to capture food as protection from predators

—> sea anemones and jellyfish live as individuals but hydrates and corals often form colonies

\*Test questions\* (matching)

Coral=B (Cnidaria)

Hydras=B (Cnidaria)

Jellyfish=B (Cnidaria)

## **Cnidarian bodies**

All have one body opening and radial symmetry have 2 cell layers arranged into tissue and a digestive cavity for breaking down food

They have “*nerve nets*” which are a system of nerve cells that send/deliver impulses for simple responses and movement

All are “filled” with **mesoglea**—non-living jelly substance between their “skin” layers

They have **tenticals**—arm-like structures with cnidocytes that surround their mouth

\*\*\*two body types:

**Polyps**—are shaped like a vase and are usually sessile (anemones, corals, hydras, and...)

**medusae**—(singular is medusa) which are bell-shaped and can swim (jellyfish)

## Cnidarians, cont'd

**Food:** the tentacles are covered in cnidocytes that are like spring-loaded poisonous harpoons that are shot when the “right” kind of contact is made

—> when they're shot at barbs cause them to stick into the prey trapping it, and the poison leaves them stunned helpless

The tentacles bring the food to the “mouth” where it's digested in the stomach cavity. Waste is expelled through the same opening

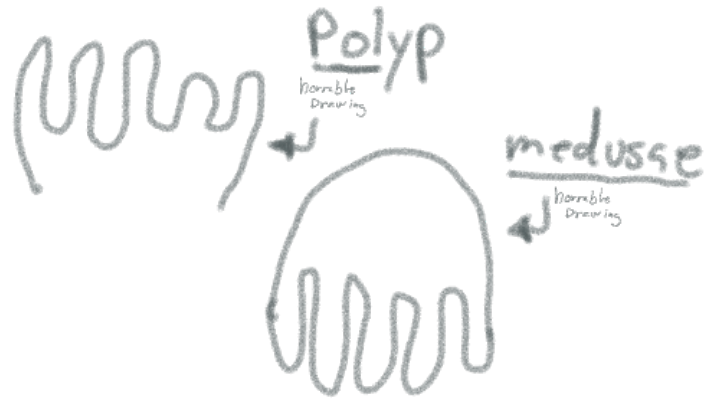
**Reproduction:** cnidarians reproduce asexually or sexually

Polyp forms (anemones) reproduce asexually by “budding” where they produce little identical selves that eventually fall off to grow elsewhere

—> polyp also produce sperm and eggs that are released into the water to be fertilized (sexual rep.)

Medusa forms (jellies) have 2 stages of reproduction: in the sexual stage of the swimming animals release eggs OR sperm (they are not hermaphrodites) into the water

—> the fertilized egg develops into a larva which settles down into a polyp and a new, young Medusa buds off it



**Corals:** coral reefs are colonies made of many different types of corals and are found in shallow tropical seas

They are small polyps that secrete hard *external* skeletons around themselves and on top of previous generations

—> this is an extremely slow process so when coral reefs are damaged they may never grow back

They are invaluable ecosystems that host a huge variety of sea life like underwater tropical rainforest

## Flatworms/roundworms p.385

Platyhelminthes

Worms are invertebrates with soft bodies, bilateral symmetry, and 3 tissue layers

2 types in this section: flatworms (phylum: *platyhelminthes*, 25,000 sp.) and roundworms (phylum *nematoda*, 1 million sp.)

Contains planarians, flukes, tapeworms. Most of flatworms are parasitic with complex life cycles but

some are **free-living** — means they don't depend on another organism

\*\*\*flatworms have organs, but don't have respiratory organs —> that's why they're flat: for direct gas exchange between cells and the atmosphere

**Planarians:** are free-living, have triangular head with 2 eyespots, and one Boyd opening (mouth) on the underside of the body

## **Planarians cont'd**

Planarians eat really small organisms or feed on dead bodies of larger organisms

Covered in cilia for the moment through a track of slime it secretes (when not in water)

They reproduce asexually by dividing in two or sexually (hermaphrodites) —> they're also capable of regeneration

**Flukes:** all are parasites with complex life cycles usually reproduce sexually, and lay their eggs in water

—> when the eggs hatch usually infect snails. After the worm leaves the snail it then burrows into the skin of its next host (humans(?)) who's standing in the water

—> (can cause diseases of the blood, lungs, eyes, liver, and other organisms)

**Tape worms:** parasites with hooks and suckers to attach themselves to the intestines of their host (dog, cats, humans, etc). Can grow to almost 40 feet long

No digestive system: absorbs food that is passing against it through the host digestive system

Ribbon-like body grows as it adds individual segments to itself behind its "head"

—> the segments contain both male/female reproductive organs and fertilize themselves

—> segments at the end of the body break off and leave with the host's waste. When another host eats the egg, it will hatch in **its** intestine...

## **Nematoda**

Roundworms are the most common type of many-felled organisms on Earth

Most are free-living but some are parasitic. They're found in soil, animals (heart-worms in dog...) plants, freshwater, and salt water

They are long and "tapered" at both ends (gradually gets thinner)

Sexual reproduction: there **are** male/female worms

\*\*\*the most important distinction of roundworms from the other animals so far their **complete** digestive system. The other organisms have **incomplete** digestive systems

—> the food travels one direction throughout the body from the mouth to the **anus** — opening at the end of the digestive tract where waste leaves

