

Chapter 11 Section 1 Notes

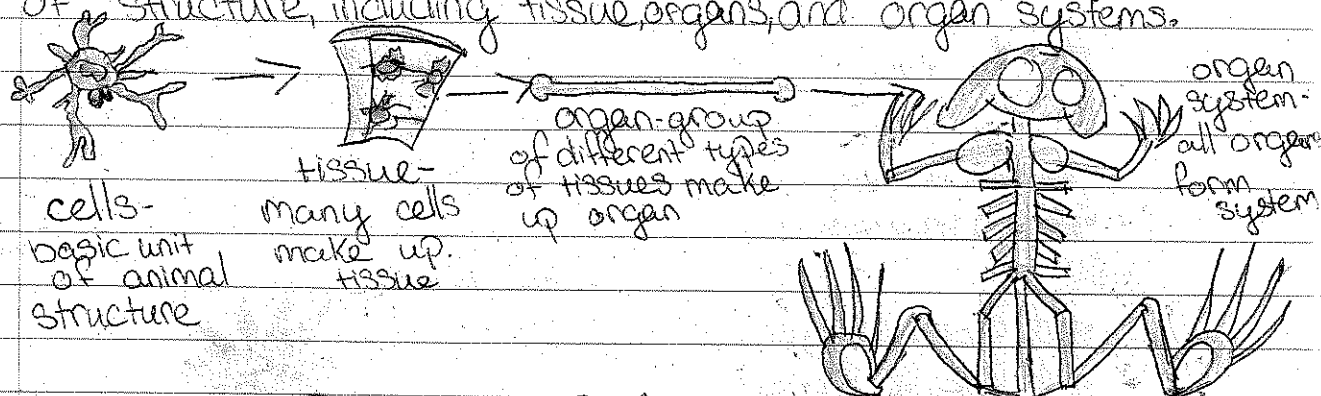
What is an Animal

Structure of Animals

• anatomy - organism's structure

• physiology - study of functions in organisms

KEY: The cells of most animals are organized into higher levels of structure, including tissue, organs, and organ systems.



Functions of Animals

KEY: Some major functions of animals are obtaining food and oxygen, keeping internal conditions stable, moving, and reproducing.

- adaptations allow animals to perform these functions

- cells, tissues, organs, and organ systems are closely related to function

Obtaining Food and Oxygen

• gets food by eating other organisms (animals, plants, or both)

• food provides raw materials for growth and energy

• get oxygen from air or water

Keeping Conditions Stable

• animals cannot survive without stable conditions

- else cells get too hot and start to die

• adapts to stay cool (stay in shade, pant)

Movement

• all animals move at some point in lives - some move throughout life, other only move in very beginning stages of life

• muscles contract and move animals body - muscles attach to bones by tendons, move - pull bones, bones move

Reproduction

- sexually-male sperm + female egg cell join-called fertilization
- new individual forms-different from both parents
- asexually-produce organism identical to both parents

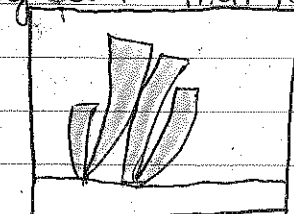
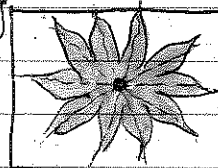
Symmetry

KEY Symmetry is a balanced arrangement of body parts that is characteristics of many animals.

- bilateral symmetry- just one line of symmetry
- radial symmetry- more than one line of symmetry

Animals with Radial Symmetry

- no distinct front or back ends
- all live in water
- don't move very fast



no Symmetry
radial
symmetry

Animals with Bilateral Symmetry

- larger + more complex than radial symmetry
- move quicker/move efficiently
- sense organs in front



bilateral
symmetry

Classification of Animals

- more than 1.5 million species of animals
- such as insects, sponges, spiders, mammals, birds, and cnidarians

KEY Animals are classified according to how they are related to other animals. These relationships are determined by an animal's body structure, the way the animal develops and its DNA.

- vertebrates- animals with backbone (in one phylum)
- invertebrates- animals without backbone (97% of animals)
- phylum- major animal classification groups
- biologist continue to find new species
- think animal life has evolved from single-celled ancestors

Chapter // Section 2 Sponges and Cnidarians Sponges

- live all over world, mostly oceans, also in rivers, lakes
- adults attach to rocks under water
- water currents take food + oxygen to them, remove waste products
- transport young to new places to live

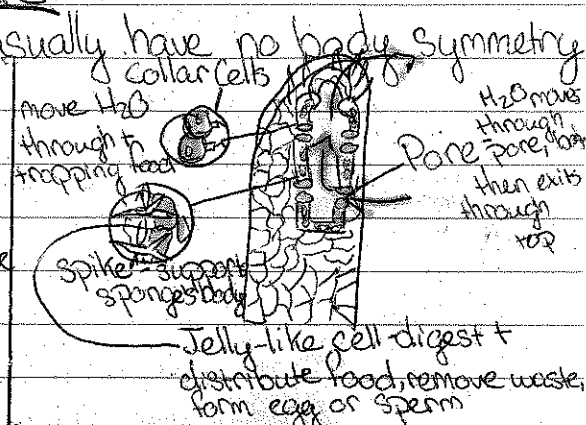
Body Structure

KEY: Sponges are invertebrates that usually have no body symmetry and never have tissues or organs.

- do have cells

Reproduction

- 1. produce both egg + sperm cells 2. release sperm 3. sperm find another sponge + fertilize 4. larva develops
- larva - immature form of an animal that looks very different from adult
- sponges also reproduce asexually



Cnidarians

- cnidarians - invertebrates that have stinging cells and take food into a central body cavity
- jellyfish, sea anemones, small corals

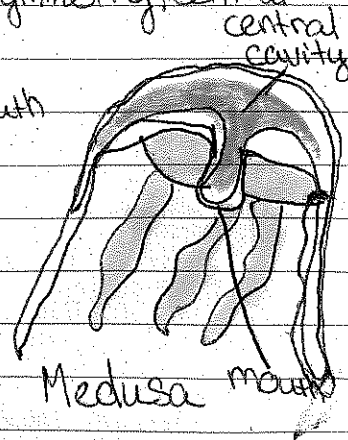
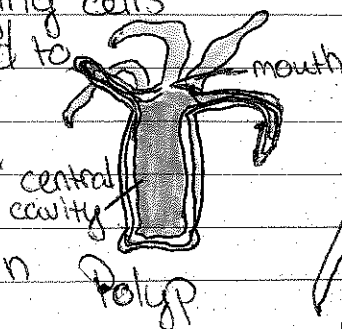
Body Structure

- two types - polyp + medusa, both have radial symmetry, central hollow cavity, tentacles w/ stinging cells
- polyps adapted to live attached to underwater surface
- medusa - swimming life, downward mouth + tentacles

- some are both polyp + medusa in life, some are one or other

Obtaining Food


- when prey touches stinging cell - threadlike structure




explodes out of cell and into prey

-some stinging cells release venom into prey

•tentacles pull prey into mouth-passes to cavity-digested-extra is expelled through mouth

Stinging Cell At Rest!  Trigger

Stinging Cell After Firing:  Spines
Movement

•many cnidarians can move to escape danger

-including jellyfish + hydras

•movements are directed by nerve cells spread out like basketball net

Reproduction

•both asexually + sexually

-~~some~~ ^{some} use budding

-some species have both sexes in one, some are individual

•many cnidarians have life cycles

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Sci. 7th period
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Chapter 11 Section 3

Worms and Mollusks

Characteristics of Worms

KEY: All worms are invertebrates that have long, narrow bodies without legs.

-three phyla- Flatworms, roundworms, segmented worms
(Platyhelminthes) (Nematoda) (Annelida)

Body Structure

- bilateral symmetry-head + tail ends
- tissues, organs, body systems

Nervous System

- brain-knot of nerves tissues located in the head end
- controls body functions, worms are simplest organism with brain
- worms can detect objects, food, mates, and predators + respond

Reproduction

- asexually-some divide into two genetically identical worms
- sexually-separate male/female or hermaphrodite-have eggs + sperm, exchange sperm w/ another worm

Flatworms

KEY: Flatworms are flat and soft as jelly.

- parasite-organism that lives inside or on another organism
- host-organism on which a parasite lives
- parasites don't usually kill hosts, but weaken them
- some flatworms are free living

Planarian

- free living, feeds on decaying material/matter or attacks animal smaller than itself
- inserts feeding tube into food, digestive juices break up food, which is sucked into body and digested
- can detect light w/ eyespots, but rely on smell

Tapeworm

- live by absorbing food from host's digestive system
- some live in human, most in more than one host

Roundworms

- can live in nearly any moist environment - some parasites, some free

KEY: Unlike cnidarians or flatworms, roundworms have a digestive system that is like a tube, open at both ends - enters at mouth, exits through anus

- anus - far end of tube where waste exits
- digestion happens in orderly stages from front to back
- allows animal to absorb large amounts of food

Segmented Worms

Body Structure

KEY: Earthworms and other segmented worms have bodies made up of many linked sections called segments

- each segment is nearly identical on outside, on inside some organs are repeated, some are only found in certain segments

- have brain and nerve cord, one-way digestive system w/ two openings

Circulatory System

- closed circulatory system - blood moves only within a connected network of tubes called blood vessels
- moves blood much faster than open system

Characteristics of Mollusks

- mollusks - invertebrates with soft, unsegmented bodies that are often protected by a hard outer shell

KEY: In addition to a soft body often covered by a shell, a mollusk has a thin layer of tissue called a mantle that covers its internal organs, and an organ called a foot.

- foot has different functions such as crawling, digging, or catching

Body Function

- bilateral symmetry, digestive system w/ two openings
- body organs aren't repeated

Circulatory System

- open circulatory system - blood isn't always inside blood vessels
- heart pumps into body, blood eventually returns to heart

Obtaining Oxygen

- gills - organs that remove oxygen from water
- cilia make water flow over gills, oxygen goes into blood

Diversity of Mollusks

- grouped by characteristics - presence of shell, type of foot, type of nervous system

KEY: The three major groups of mollusks are gastropods, bivalves, and cephalopods

Gastropods

- gastropods - single or no shell, some herbivores, some scavengers, some carnivores, snails or slugs
- radula - flexible organ w/ tiny teeth
- most creep along on broad, leave mucus

Bivalves

- bivalves - mollusks that have two shells held together by hinges and strong muscles
- filter tiny organisms from water to eat (most herbivores)
- adults move slowly or not at all

Cephalopods

- cephalopods - ocean dwelling mollusk whose foot forms tentacles around the mouth
- carnivores
- use tentacles, large eyes, nervous system, + memory to capture prey

Chapter // Section 4 Arthropods

- arthropods-members of arthropod phylum (crab, lobster, centipedes, scorpion, spider, grasshopper)

Characteristics of Arthropod

KEY Arthropods are invertebrates that have an external skeleton, a segmented body, and jointed attachments called appendages.

-such as wings, mouthparts, legs

KEY The major groups of arthropods include crustaceans, arachnids, centipeds, and millipeds, and insect.

- bilateral symmetry, open circulatory system, digestive system w/ two openings, most reproduce sexually

Outer Skeleton

- **exoskeleton**-waxy, waterproof covering (outer skeleton)
- protects + prevents water from evaporation
- **molting**-process of shedding an outgrown exoskeleton

Segmented Body

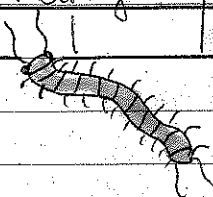
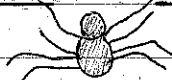
- centipeds + millipeds are made up of many identical segments
- have head, midsection, hind section at most

Jointed Appendages

- have joint appendages attached to body
- give flexibility + ability to move, get food, reproducing, + sense
- such as legs, wings
- **antenna**-appendage attached to the head that contains sense organs

Diversity of Arthropods

Characteristic	Crustacean	Arachnids	Centipeds/ Millipeds	Insects
# of Body Sections	2 or 3	2	2	3
Pairs of Legs	5 or more	4	Many	3
Pairs of Antennas	2	None	1	1



Crustacean

- crustacean such as crayfish, lobster, shrimp, crabs

KEY: A crustacean is an arthropod that has two or three body sections, five or more pairs of legs, and two pairs of antennae

- live in watery environments, most have gills
- most begin life as tiny swimming larvae
- ~~metamorphosis~~ process in which an animal's body undergoes dramatic changes in form during its life time

Arachnids

- arachnids such as spiders, mites, ticks + scorpions

KEY: Arachnids are arthropods with two body sections, four pairs of legs, and no antennae.

- 1st section-head + midsection, 2nd section-abdomen

• abdomen-2nd section that contains reproductive organs and part of digestive system

- all spiders are predators, most eat insects

Centipedes and Millipedes

KEY: Centipedes and millipedes are arthropods with two body sections and many pairs of legs.

- head w/ pair of antennae, long abdomen w/ many segments

• centipedes can have 100 segments-pair of feet per segment

• millipedes-80+ segments-2 pairs of feet per segment

Characteristics of Insects

- insects-most common type of arthropod

KEY: Insects are arthropods with three body section, six legs, one pair of antennae, and usually one or two pairs of wings.

- three sections are head, thorax, abdomen

Head

- brain, sense organs, have well-developed nervous system
- two large compound eyes-enable to see surroundings + movement

- simple eyes distinguish between light/dark

Thorax

- ~~thorax~~ insect's midsection, section where wings + legs attach
- most adult insects can fly, only invertebrates that can

Abdomen

- contains most of internal organs
- small holes on outside transfer oxygen directly to cells

Insect Life Cycles

KEY Each insect species undergoes either complete metamorphosis or gradual metamorphosis.

Complete Metamorphosis

- ~~complete metamorphosis~~ - four stages (egg, larva, pupa, adult)

- ~~pupa~~ stage after larva, major changes in body structure occur

- beetles, butterflies, flies, ants all undergo

Gradual Metamorphosis

- ~~gradual metamorphosis~~ - no distinct larva, egg - nymph - adult

- ~~nymph~~ - looks like adult w/out wings - molts several times then adult

- grasshoppers, termites, cockroaches, dragon flies

Chapter 11 Section 5

Echinoderms

Characteristics of Echinoderms

- echinoderm - member of phylum Echinodermata (sea cumbers, sea star, sea urchins, sand dollars)

KEY: Echinoderms are invertebrates with an internal skeleton and a system of fluid-filled tubes called a water vascular system.

all live in salt water

Body Structure

- endoskeleton - internal skeleton made of hardened plates - support animal + give bumpy texture
- radial symmetry like spokes on wheel (multiples of 5)

Movement

- water vascular system - internal organ system of fluid-filled tubes in echinoderms
- tube feet - structure where water is forced into - are sticky, act like suction cups, used to move + catch food

Reproduction and Life Cycle

- almost all are male or female
- egg is fertilized in water, turns into larvae
- metamorphosis until adult echinoderm

Diversity of Echinoderms

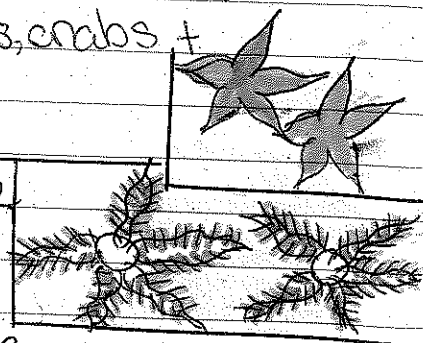
KEY: There are four major groups of echinoderms: sea star, brittle star, sea urchin, and sea cucumbers.

- Sea stars - predators that eat mollusks, crabs + other echinoderms

- tube feet to move + capture prey

- brittle star - waves arms in snakelike motion to move, catch prey w/ tube feet

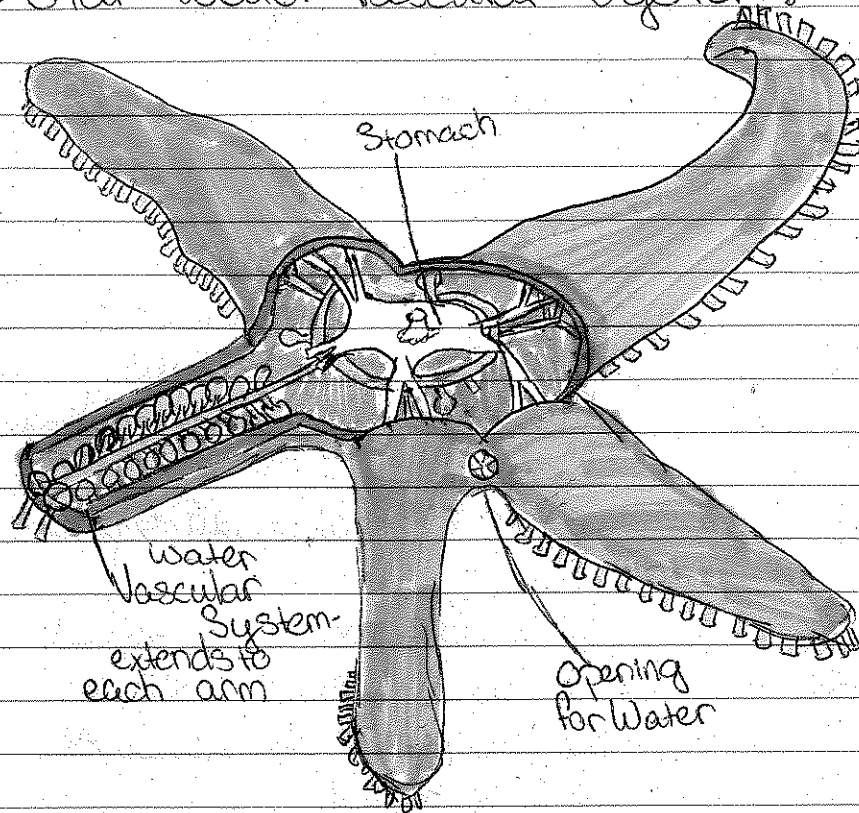
- sea urchin - no arms, spines protect, move with tube feet in between spines, eat w/ five tooth like structures



- Sea cucumber-crawl w/ tube feet on underside, eat w/ mouth surrounded by tentacles



Sea Star Water Vascular System:



Stomach

Water
Vascular
System
extends to
each arm

opening
for water