

## I. Animal Diversity

1. What are some basic characteristics of the animal kingdom? What characteristics make them different from plants?

- eukaryotic, heterotrophic (we don't make our own food), we store carbs as glycogen, sexual reproduction is most prominent form of reproduction, no cell wall, gastrulation
- animals differ from plants in that plants have a cell wall, they can undergo different types of reproduction (asexual, budding), they store carbs as starch, they do not undergo gastrulation, plants do have different types of meristematic tissue (embryonic tissue) but they do not form the same way animal layers form

2. What is gastrulation? Is this kingdom specific? Phylum specific? Explain the basic process of embryonic development

- gastrulation is the process by which different embryonic tissues develop
- gastrulation is specific to the kingdom Animalia (except sponges, they don't have tissues!) but is common to all phyla

1. The zygote undergoes cell division (mitosis) to form an eight celled embryo

2. Cell division continues to create a blastula (hollow ball of cells that surrounds a blastocoel)

3. Gastrulation! A portion of the cells begins to fold inward

- The archenteron is the hollow part in the middle of the embryo- this becomes the gut
- The outside cells become the ectoderm
- The inside cells become the endoderm
- The blastopore becomes the anus or mouth

3. Choanoflagellates resemble what? What is the significance of this resemblance?

Choanoflagellates resemble the collar cells (choanocytes) in sponges. This demonstrates there is a common ancestor that links all animals

4. What is the Cambrian explosion and what are the hypothesized causes of this period?

The Cambrian explosion is a period in time where animal diversity exploded. The number of types of animals increased dramatically. Causes that led to this explosion are:

An increase in O<sub>2</sub>- allowed animals to metabolize more and grow larger

Predator/Prey relationships and natural selection

Hox genes (regulatory genes)- produced genetic variation in organisms

5. What are the two types of symmetry? How do they differ?

Radial- like a pie, these animals have no distinct sides

Bilateral- are split into halves, have a front/back and sides

6. Complete the following chart:

Type of Coelom	Organization of body cavity
Acoelomate	No body cavity (coelom) Outer portion of body is lined with ectoderm

	Middle Portion is filled with mesoderm Endoderm lines the digestive cavity
Pseudocoelomate	Outer portion of body is lined with ectoderm Mesoderm lines the ectoderm Digestive tract is lined with endoderm only
Coelomate	Outer portion of body is lined with ectoderm Mesoderm lines both the ectoderm and digestive tract with a space in between the layers of mesoderm (the coelom)

7. Complete the following table

	Protostome	Deuterostome
Cleavage	Spiral and determinate	Radial and indeterminate
Coelom Formation	Masses of mesoderm form on each side of the archenteron near the blastopore and grow towards the cavity	Mesoderm grows as an out pocket of the archenteron
Fate of Blastopore	Blastopore becomes mouth	Blastopore becomes anus

Determinate growth: if cells are separated early in development only one cell will become an animal

Indeterminate growth: if cells are separated early in development each cell can become an animal

8. What is the Parazoa/Eumetazoa split?

The sponges differ from all other animals in that they do not have tissues and do not have symmetry, Eumetazoa radial symmetry

II. Animal Phyla

Kingdom Animalia

Subkingdom Parazoa

Phylum Porifera

Phylum Porifera

Y/N tissues

Y/N organ systems

Symmetry: asymmetrical

Body plan: sac type

Digestion: intracellular

They feed by:

Collar cells- drive water past the cells via flagella

Amoebocytes- distributes food, stores food, gets rid of wastes

Three classes:

Calcarea have calcium carbonate spicules

Hexactinellida have silica spicules  
Demospongia have spongin spicules

Reproduction: Asexual or budding  
Larvae is \_\_\_\_\_ ciliated \_\_\_\_\_

Kingdom Animalia  
Subkingdom Eumetazoa  
Phylum Cnidaria

Phylum Cnidaria

Y/N Tissues

Y/N vascular system

Symmetry: radial

Digestion is \_\_\_\_\_ extracellular \_\_\_\_\_ and then taken into the cells via  
\_\_\_\_\_ phagocytosis \_\_\_\_\_

They have \_\_\_\_\_ nerve \_\_\_\_\_ \_\_\_\_\_ nets \_\_\_\_\_ which are noncentralized  
arrangements of neurons

Cnidocytes which are unique to this phylum have a \_\_\_\_\_ nematocyst \_\_\_\_\_ which is a whip like  
barb

Alternation of generation: polyp (stationary) and medusa (free floating)

Class Hydrazoa

Exist only as a \_\_\_\_\_ polyp \_\_\_\_\_

Larva are called \_\_\_\_\_ planula \_\_\_\_\_

Class Scyphozoa

\_\_\_\_\_ Medusa \_\_\_\_\_ is the dominant stage

Known as the \_\_\_\_\_ true \_\_\_\_\_ jellyfish

Class Cubozoa

Known as \_\_\_\_\_ box jellies \_\_\_\_\_ and \_\_\_\_\_ sea wasps \_\_\_\_\_

Class Anthozoa

Only stage present is \_\_\_\_\_ polyp \_\_\_\_\_

Includes the \_\_\_\_\_ corals \_\_\_\_\_ and \_\_\_\_\_ sea anemones \_\_\_\_\_

Build coral reefs through coral skeletons

Symbiotic relationship with algae called \_\_\_\_\_ zooxanthellae \_\_\_\_\_

The skeletons of corals are \_\_\_\_\_ hydrostatic \_\_\_\_\_ meaning their cells can \_\_\_\_\_ contract

Phylum Ctenophora

Commonly known as the \_\_\_\_\_ jellies \_\_\_\_\_ due to their \_\_\_\_\_ 8 comb rows \_\_\_\_\_

Symmetry: radial

These are the largest animals to use \_\_\_\_ cilia \_\_\_\_\_ to move  
Y/N tissues

## THE ACOELOMATES

### Phylum Platyhelminthes

Commonly known as the \_\_\_\_ flatworms \_\_\_\_\_

They have a branched gastrovascular cavity with \_\_\_\_ extracellular \_\_\_\_\_ and  
\_\_\_\_ intracellular \_\_\_\_\_ digestion

Y/N circulatory system

Y/N respiratory system

Have special \_\_\_\_ flame cells \_\_\_\_\_ located in the \_\_\_\_ protonephridia \_\_\_\_\_ which aide in excretion

Have \_\_\_\_ nerve chords \_\_\_\_\_ which help to communicate with the left and right sides of the body

Body Plan: tube in tube

### Class Turbellaria

Includes the \_\_\_\_ Planaria \_\_\_\_\_

Have \_\_\_\_ eye spots \_\_\_\_\_ which are only sensitive to light

Are capable of learning

### Class Trematoda

Commonly known as the \_\_\_\_ flukes \_\_\_\_\_

Y/N all are parasitic

### Class Cestoda

Commonly known as the \_\_\_\_ tapeworms \_\_\_\_\_

\_\_\_\_ Scolex \_\_\_\_\_ is the head region

Have \_\_\_\_ proglottids \_\_\_\_\_ which are repeating sections of reproductive organs

## The Pseudocoelomates

### Phylum Rotifera

Commonly known as the \_\_\_\_ rotifers \_\_\_\_\_

These are special in that they each organism has the same number of \_\_\_\_ cells \_\_\_\_\_

Use a \_\_\_\_ mastax \_\_\_\_\_ to grind food

Parthenogenesis can occur

Have a complete digestive system

Body plan: tube in tube

Y/N organs

### Phylum Nematoda

Commonly known as the \_\_\_\_ round worms \_\_\_\_\_

Can be free-living or \_\_\_\_ parasitic \_\_\_\_\_

Have a hydrostatic skeleton

Body Plan: tube in tube

Y/N organs