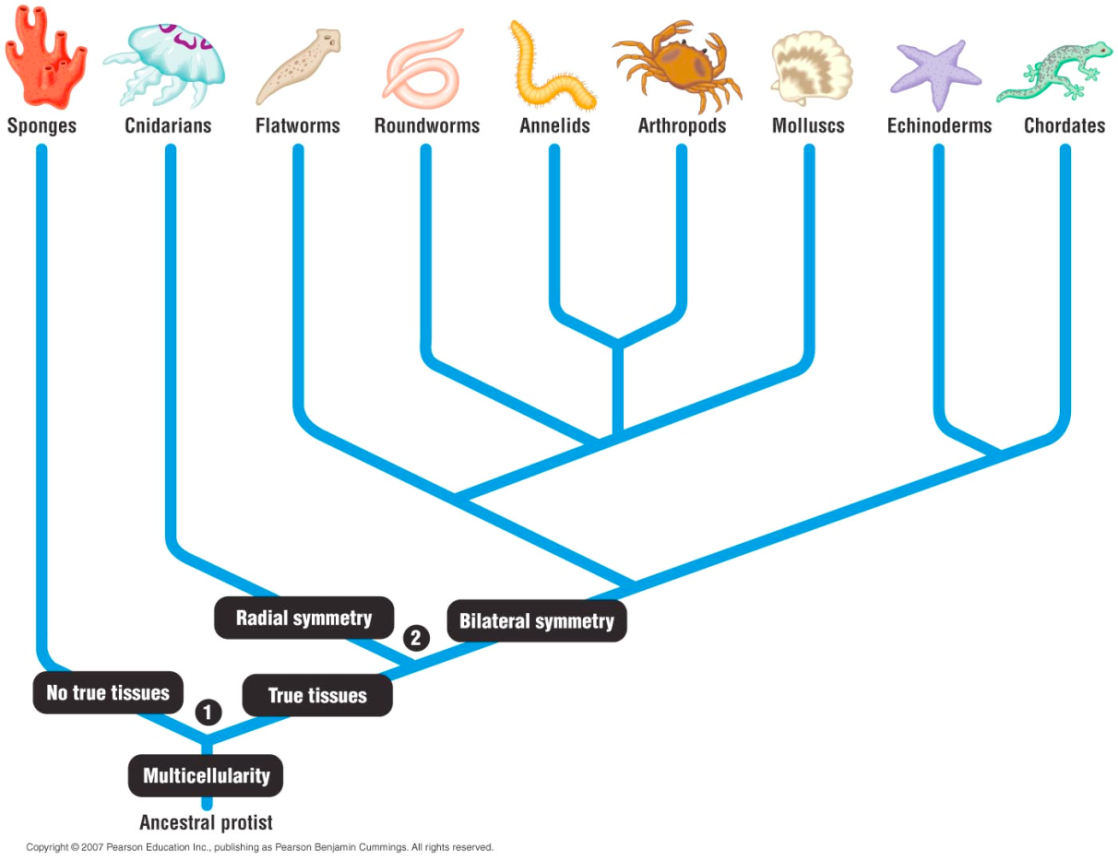
**Kingdom Animalia**

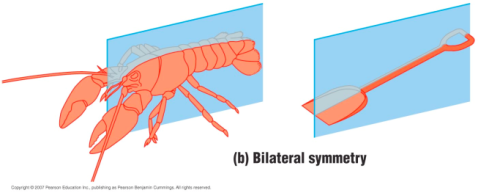
From the fossil record, we can determine that the first animals appeared on earth approximately 1.2 billion years ago. These first animals were very simple organism, similar to the sponges still found in our oceans today.

No matter how simple or complex, all animals have certain characteristics in common:

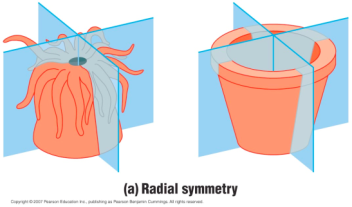
* They are all \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which means they are made up of more than one cell.
* They are all \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which means their cells have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (protects their DNA - genetic information) and has membrane bound structures with specialized jobs called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* They are all \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because they must **consume** other organic materials to get energy (their cells cannot make their own food).

The pictures shown represent 9 different phyla of animals.





**Bilateral symmetry**: when there is only **one** way to divide something into mirror image halves



**Radial symmetry**: parts arranged around a central point

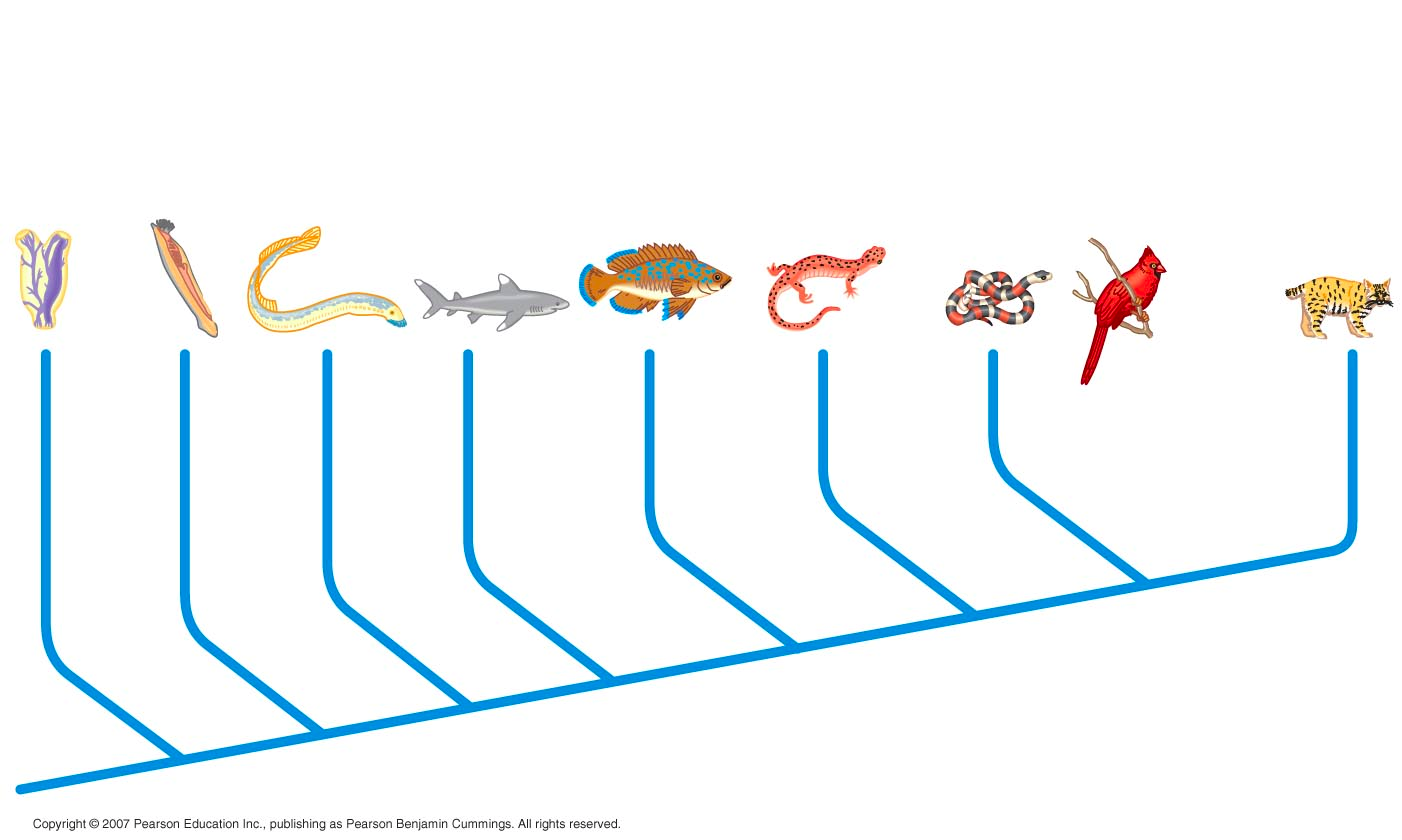
1. Based upon this cladogram, what is the common ancestor of all animals? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which group of animals is the most primitive (primitive = simplest)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Which group is the most complex? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Which group of animals is more closely related to the Molluscs: Echinoderms or Roundworms (circle one)

Like most organisms on the planet, through mutation and natural selection, animals changed over time as they adapted to new and changing environments. Eventually early animals ventured onto land. This presented several struggles: lack of support, water loss and new methods of reproduction

**Vertebrate or Invertebrate**: One feature used to describe animals is whether they have a backbone or not.

* + Majority of animals are **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, which mean that they do not have a backbone.
  + Animals like us are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which means that they have a backbone.

The vertebrates can be divided up into 5 classes (or groups) each having a unique set of characteristics:

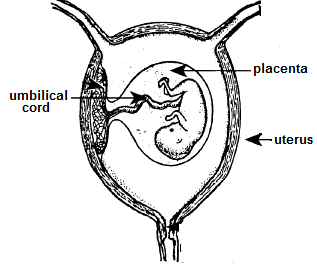


|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Key Characteristics** | **Fish** | **Amphibian** | **Reptiles** | **Birds** | **Mammals** |
| **Body Covering** |  |  |  |  |  |
| **Reproduction** |  |  |  |  |  |
| **Development** |  |  |  |  |  |
| **Heart** |  |  |  |  |  |

**Reproduction**

Most animals reproduce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which creates genetic variation among offspring.

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - fertilization/development of the egg occurs inside the body
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - fertilization/development of the egg occurs outside the body
  + Animals that rely upon external fertilization and/or development typically lay 100’s to 1000’s of eggs. Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



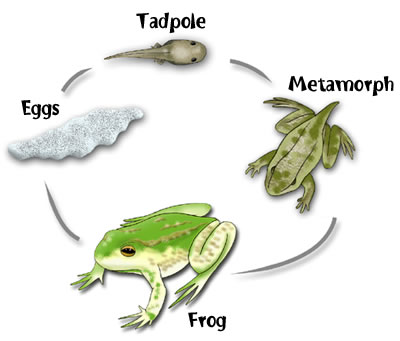
Most mammals have internal development – baby develops inside mom surrounded by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which controls nutrient and gas exchange between mom and baby.

**Growth & Development**

* Some animals like arthropods (crabs, spiders, insects) must \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or shed their exoskeleton in order to grow. During this time they are vulnerable since they need to wait for their new skeleton to harden.
* Animals use chemicals called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to help cause changes needed for growth & development.

Some organisms, including grasshoppers & frogs, undergo \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or a major change to become an adult. There are two types:

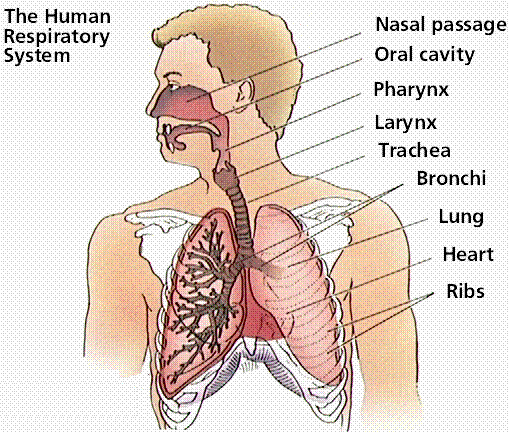
|  |  |  |
| --- | --- | --- |
|  | Young look like small versions of adults | Adult GrashopperEgg Sac Nymph  Egg 🡪 Nymph 🡪 Adult |
|  | Young look different from adults & often live in different environments to reduce competition. | AdultPupaEgg Larva  Egg 🡪 Larva (caterpillar) 🡪 Pupa 🡪 Adult |



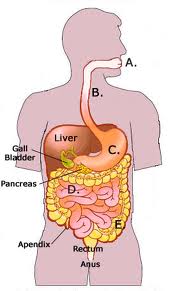
Why might it be an advantage for the juvenile (tadpole) and adult frog to live in different environments? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Respiration**

Animals take in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and release \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Amphibians, reptiles, birds and mammals all have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* There are many blood vessels within the lungs so the oxygen can go right into the bloodstream for delivery throughout the body.
* Some organisms such as frogs and worms can also breathe absorb oxygen through their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The skin of these organisms must stay \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + What do tadpoles use for gas exchange? \_\_\_\_\_\_\_\_

**[](http://www.google.com/imgres?um=1&hl=en&tbo=d&biw=1440&bih=732&tbm=isch&tbnid=-n39jJ78PYmlhM:&imgrefurl=http://avialoi.com/modules/com_joomfish/?digestive-system-of-humans-1778&docid=of8xXbqxqDGDIM&imgurl=http://www.glogster.com/media/1/4/4/96/4049619.jpg&w=271&h=456&ei=kqvCUPi4E4L88gSalIGgCQ&zoom=1&iact=hc&vpx=696&vpy=324&dur=949&hovh=291&hovw=173&tx=120&ty=200&sig=112403574204921376778&page=1&tbnh=145&tbnw=81&start=0&ndsp=37&ved=1t:429,r:23,s:0,i:158)Nutrition**

Animals are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which means they must eat.

The typical digestive system of animals includes a mouth, esophagus, stomach, small intestine and large intestine.

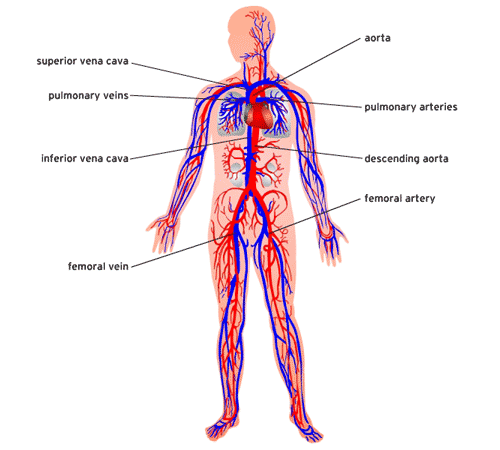
* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ breaks down the food.
* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ main job is to absorb the nutrients from the food. There are many blood vessels attached to the small intestine so the nutrients enter directly into the blood stream and are transported throughout the body.
* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ absorbs excess water and creates solid waste. This system is modified depending on an animal’s diet.



The intestine is the longest part of the digestive system. It is not a smooth tube, but instead the inside surface is covered with many folds (villi).

**How does the surface of the small intestine help with its function?** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

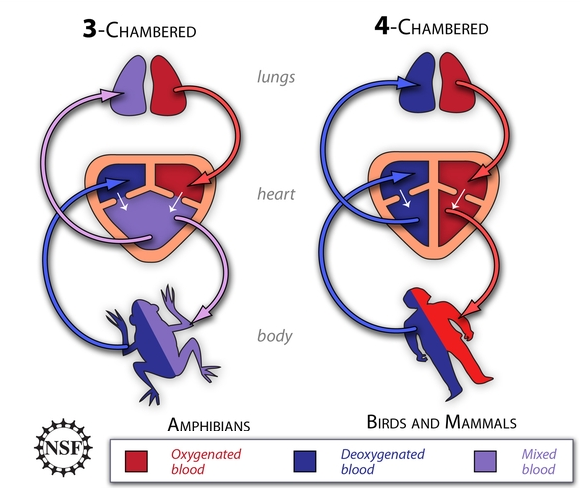
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Transport**

Most animals have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ system to transport food, gasses and wastes throughout the body.

The circulatory system of many animals includes a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to pump the blood through the arteries, veins and capillaries.

In larger organisms this network of blood vessels is necessary to ensure blood carrying nutrients and oxygen makes it to all parts of the body.

As animals evolved and became more complex, they developed more efficient systems for transporting material through their bodies.

* Amphibians and some reptiles have a \_\_\_\_ chambered heart and are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - rely on the environment to maintain their body temperature.
* Birds and mammals have a \_\_\_ chambered heart and are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, maintain own body temperature internally.
* A 3-chambered heart would not work for humans because there is mixing of oxygenated and deoxygenated blood so both are sent out to the body. This system works in amphibians because they have another method of getting oxygen into their blood stream… using their \_\_\_\_\_\_\_\_\_\_\_\_\_\_.