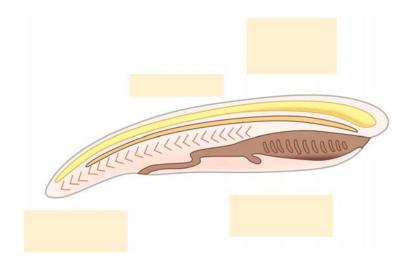
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Chapter 34: Vertebrates

Concept 34.1 Chordates have a notochord and a dorsal, hollow nerve cord

- 1. We are *vertebrates*. What phylum do we belong to?
- 2. What other phylum might be considered our close relatives? Why?
- 3. Here is a figure showing the four key chordate characteristics. Label and explain each one.



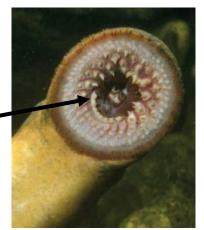
- 4. One of the important characteristics is a *notochord*. What is a *notochord*?
- 5. For us, as vertebrates, what remains of the *notochord*?
- 6. Chordates are the first group to show a *dorsal nerve cord*. Which embryonic layer forms the nerve cord?

- 7. *Pharyngeal gill slits* develop into what structures in the fishes?
- 8. In tetrapods, what do the *gill slits* become?
- 9. Vertebrates are not the only chordates. The *lancet* displays a number of chordate characteristics, and the ancestral chordate may have resembled a lancet. Describe a *lancet*.

Concept 34.2 Vertebrates are craniates that have a backbone

They are *jawless* parasitic fish with a skeleton made of

______. Look at the mouth! Lampreys
have invaded the Great Lakes and damaged the fishing industry
there.



Concept 34.3 Gnathostomes are vertebrates that have jaws

- 11. *Gnatho* means "jaw," and *–stome* means "mouth." This group includes the sharks, fishes, amphibians, and reptiles. From what structure is it believed that jaws evolved?
- 12. What animals are in the clade *Chondrichthyes*?
- 13. What does the name *Chondrichthyes* mean? What material makes up their skeleton?
- 14. Why do sharks have to swim continuously?
- 15. The "fishes" with a bone skeleton are aquatic *Osteichthyes*. How do they breathe?

16. What is the function of a swim bladder?

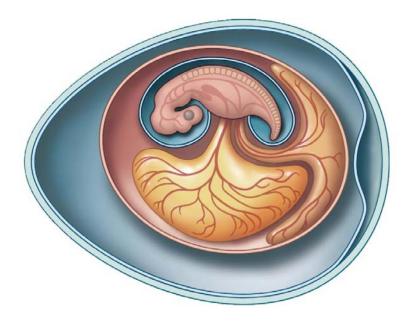
	Concept 34.4 Tetra	pods are g	gnathostomes	that I	have	limb	S
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17.	What does tetrapod mean?	
18.	What animals are in the class <i>Amphibia</i> ?	
19.	What does the class name Amphibia mean?	
20.	Frogs have a life cycle with an aquatic larval stage, the tad	<i>lpole</i> . How do <i>tadpoles</i> breathe?
21.	How do adult frogs breathe? (two ways)	
22.	Fertilization in amphibians is very high.	The eggs lack a shell, and mortality is
23.	What factors tie <i>amphibians</i> to a life near water?	
~		

Concept 34.5 Amniotes are tetrapods that have a terrestrially adapted egg

- 24. What is an *amniotic egg*? How has it enabled animals to occupy a wider range of terrestrial habitats than amphibians can?
- 25. What groups have an amniote egg?

26. Label the four *extraembryonic membranes* seen in an *amniotic egg*, and explain the role of each one.



- 27. What animals are in the *reptile* clade?
- 28. Read the second paragraph about reptiles carefully, and then make a list of five characteristics of reptiles.

Reptile Characteristics				

29. What is the body covering of a reptile? How does this enable it to live a more terrestrial life?

30.	What is internal fertilization? How does this enable reptiles to reproduce on land?
31.	Fishes, amphibians, and reptiles are <i>ectothermic</i> . What does this mean?
32.	Birds are in the reptile clade. Which extinct group included their closest relatives?
33.	Here is a short list of some reptiles. For each group on the list, give some important features that make them unique.
	snakes
	lizards
	turtles
	alligators and crocodiles
	birds
34.	What are four avian adaptations for flight?
Ada	ptations for Flight

Concept 34.6 Mammals are amniotes that have hair and produce milk

35.		east five traits of mammals, including the two the traits unique to mammals.	in the concept heading. Put an
36.	There are three grean example.	oups of mammals. Contrast the groups based of	on how they bear young, and give
Man	ımalian Group	Reproduction	Example
Mon	otremes		•
Mars	supials		
Euth	erians		
37.	As a human, you a primates only?	are in the class <i>Mammalia</i> and the order <i>Prima</i>	ates. What features are unique to
Testi	ng Your Knowledg	dy to test your knowledge. Place your answers e: Self-Quiz Answers456	here:
	3	· v	