



## Reading

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**DIRECTIONS:** This section tests your ability to comprehend academic reading passages. It consists of one passage and a set of questions about it. All of the questions are worth one point except for the last question. Special directions for the last question will tell you how many points it is worth.

You have 20 minutes in which to complete this section of the test.

In the passages, some words or phrases are underlined in blue. You can click on these words to get a definition or explanation.

As soon as you have finished one question, you may click on NEXT to move to the next question. You may skip questions and come back to them later, and you can change your answers if you wish. To return to a previous question, click on BACK.

As soon as you have read these directions, go on to the first reading.



## Reading

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### A Transitional Fossil



## Reading

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Paleontologists long ago established that the first animals to move from the ocean to land must have done so during the Devonian Era, approximately 400 million years ago. As these ancient animals moved out of the ocean, they slowly began developing physical features, such as limbs and lungs, suited to the atmospheric and gravitational demands of terrestrial life. For years, [paleontologists](#) attempted to determine from fossil fragments what the first land-based animals might have looked like. Then in April 2006, researchers in Canada's Nunavut Territory discovered an amazingly well-preserved and complete skeleton of a creature they believe is an important missing link showing how these early land animals probably evolved.

The two-foot-long fossil is of an animal that scientists have named *Tiktaalik roseae*, which means "large shallow water fish" in the language of the region's Inuit people. This creature lived 370 million years ago in what was at the time part of a large, swampy landmass near Earth's equator--[plate tectonic](#) shifts moved the land to its present location. At that time, deciduous plants were thriving, periodically shedding their leaves into the water, which attracted small prey into warm swampy shallows that were difficult for larger fish to swim in. Scientists believe that competition for food among fish in the oceans became intense, leading *Tiktaalik* and other species to begin exploring opportunities in these swampy regions.

The *Tiktaalik*'s discoverers have tentatively classified the animal as a member of the [lobe](#)-finned Sarcopterygian class, a class of fish that scientists have long considered an ancestor of tetrapods (from the Greek *tetrapoda*, meaning "four-legged"). *Tiktaalik* is thought to represent an intermediate form between fish and early four-legged amphibians. It is *Tiktaalik*'s mixture of fish and tetrapod characteristics that led one of the *Tiktaalik*'s discoverers to describe *Tiktaalik* as a "fishapod."

*Tiktaalik* was a predator with sharp teeth, a crocodile-like head, and a flattened body. *Tiktaalik*'s scales and fins qualify the creature as a fish, but in other ways the animal represented a truly new and unique species for its time. The bones in the fossil's limbs form shoulders and elbows, similar to those found in modern alligators and crocodiles. Its fins form wrists, so the *Tiktaalik* was undoubtedly able to support itself while lying flat against a surface and could propel itself on land. Like fish, *Tiktaalik* clearly had gills, but the *Tiktaalik*'s discoverers believe the animal's large, interlocking ribs provide compelling evidence that it may have also had lungs. One of the most telling differences between *Tiktaalik* and fish is that *Tiktaalik*'s head was disconnected from its shoulders. In fish, the head is rigidly attached to the shoulder girdle, meaning that fish must maneuver their entire bodies to feed. The challenge of making whole-body maneuvers on land was met in the *Tiktaalik* by freeing the skull from its bony connection to the body. *Tiktaalik*'s jaw, on the other hand, remained very fishlike. Thus, it may have been suitable for catching prey both in and out of the water, an important consideration, scientists say, for a transitional species.

The *Tiktaalik*'s discovery confirms much of what scientists had long believed about how land-based animals evolved, and provides information about the order in which evolutionary changes probably occurred. In addition to the *Tiktaalik*'s unusual combination of fish-like jaw and tetrapod-like neck, scientists also noticed that the creature lacked the bony flaps that most fish have covering their gills. Scientists had long wondered when, in the evolutionary scheme of things, animals had lost this feature. *Tiktaalik* shows that it happened before animals lived on land.

Scientists believe the *Tiktaalik* may prove to be as important a find as the *Archaeopteryx*--an animal believed to mark the transition from reptiles to birds. The completeness of the *Tiktaalik* skeleton means that scientists no longer have to piece together bits of the fossil record, as they had in the past; *Tiktaalik* gives them a fairly complete picture of an animal that blurs the distinction between fish and land-based tetrapod. It represents a very significant transition at a key moment in evolutionary history.



## Reading

**DIRECTIONS:** Read the following passage and then the questions about it. Decide which of the choices best answers each question, and mark your answers.

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- 1 In paragraph 1, the author implies that until recently, scientists have
- ☐ used fossils to determine the conditions that led animals to begin living on land
  - ☐ disagreed about when land animals first evolved
  - ☐ studied present-day animals that closely resemble the Tiktaalik
  - ☐ based their theories about early land animals upon incomplete evidence

Paragraph is indicated by an arrow ➤

➤ Paleontologists long ago established that the first animals to move from the ocean to land must have done so during the Devonian Era, approximately 400 million years ago. As these ancient animals moved out of the ocean, they slowly began developing physical features, such as limbs and lungs, suited to the atmospheric and gravitational demands of terrestrial life. For years, [paleontologists](#) attempted to determine from fossil fragments what the first land-based animals might have looked like. Then in April 2006, researchers in Canada's Nunavut Territory discovered an amazingly well-preserved and complete skeleton of a creature they believe is an important missing link showing how these early land animals probably evolved.

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## Reading

**DIRECTIONS:** Read the following passage and then the questions about it. Decide which of the choices best answers each question, and mark your answers.

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- 2 The word **terrestrial** in the passage is closest in meaning to
- ☐ territorial
  - ☐ worldwide
  - ☐ animal
  - ☐ land-based

Paleontologists long ago established that the first animals to move from the ocean to land must have done so during the Devonian Era, approximately 400 million years ago. As these ancient animals moved out of the ocean, they slowly began developing physical features, such as limbs and lungs, suited to the atmospheric and gravitational demands of **terrestrial** life. For years, [paleontologists](#) attempted to determine from fossil fragments what the first land-based animals might have looked like. Then in April 2006, researchers in Canada's Nunavut Territory discovered an amazingly well-preserved and complete skeleton of a creature they believe is an important missing link showing how these early land animals probably evolved.

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**DIRECTIONS:** Read the following passage and then the questions about it. Decide which of the choices best answers each question, and mark your answers.

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- 3 The passage mentions all of the following about the Tiktaalik fossil EXCEPT

- ☐ where it was found
- ☐ its approximate age
- ☐ its length
- ☐ how it was discovered

Paleontologists long ago established that the first animals to move from the ocean to land must have done so during the Devonian Era, approximately 400 million years ago. As these ancient animals moved out of the ocean, they slowly began developing physical features, such as limbs and lungs, suited to the atmospheric and gravitational demands of terrestrial life. For years, [paleontologists](#) attempted to determine from fossil fragments what the first land-based animals might have looked like. Then in April 2006, researchers in Canada's Nunavut Territory discovered an amazingly well-preserved and complete skeleton of a creature they believe is an important missing link showing how these early land animals probably evolved.

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**DIRECTIONS:** Read the following passage and then the questions about it. Decide which of the choices best answers each question, and mark your answers.

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- 4 According to the passage, what is true about the Tiktaalik?

- ☐ It existed more than 400 million years ago.
- ☐ It was reconstructed from separate fossils.
- ☐ It lived in a region near the equator.
- ☐ It was gradually displaced by more competitive species.

Paleontologists long ago established that the first animals to move from the ocean to land must have done so during the Devonian Era, approximately 400 million years ago. As these ancient animals moved out of the ocean, they slowly began developing physical features, such as limbs and lungs, suited to the atmospheric and gravitational demands of terrestrial life. For years, [paleontologists](#) attempted to determine from fossil fragments what the first land-based animals might have looked like. Then in April 2006, researchers in Canada's Nunavut Territory discovered an amazingly well-preserved and complete skeleton of a creature they believe is an important missing link showing how these early land animals probably evolved.

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**DIRECTIONS:** Read the following passage and then the questions about it. Decide which of the choices best answers each question, and mark your answers.

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- 5 Which of the following best expresses the essential information in the **highlighted** sentence? *Incorrect* choices change the meaning in important ways or leave out essential information.

- ☐ Warm swampy waters enabled deciduous plants to thrive and attracted large fish.
- ☐ Over time, swamps formed, which allowed new plant and animal species to evolve together.
- ☐ Swamps provided food for small animals as well as protection from predators.
- ☐ Small prey hid underneath leaves in shallow waters to avoid larger predators.

The two-foot-long fossil is of an animal that scientists have named Tiktaalik Roseae, which means "large shallow water fish" in the language of the region's Inuit people. This creature lived 370 million years ago in what was at the time part of a large, swampy landmass near Earth's equator--

**plate tectonic shifts moved the land to its present location. At that time, deciduous plants were thriving, periodically shedding their leaves into the water, which attracted small prey into warm swampy shallows that were difficult for larger fish to swim in.** Scientists believe that competition for food among fish in the oceans became intense, leading Tiktaalik and other species to begin exploring opportunities in these swampy regions.

The Tiktaalik's discoverers have tentatively classified the animal as a member of the **lobe**-finned Sarcopterygian class, a class of fish that scientists have long considered an ancestor of tetrapods (from the Greek *tetrapoda*, meaning "four-legged"). Tiktaalik is thought to represent an intermediate form between fish and early four-legged amphibians. It is Tiktaalik's mixture of fish and tetrapod characteristics that led one of the Tiktaalik's discoverers to



## Reading

**DIRECTIONS:** Read the following passage and then the questions about it. Decide which of the choices best answers each question, and mark your answers.

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- 6 The word **telling** in the passage is closest in meaning to

- ☐ significant
- ☐ moderate
- ☐ unusual
- ☐ confusing

Tiktaalik was a predator with sharp teeth, a crocodile-like head, and a flattened body. Tiktaalik's scales and fins qualify the creature as a fish, but in other ways the animal represented a truly new and unique species for its time. The bones in the fossil's limbs form shoulders and elbows, similar to those found in modern alligators and crocodiles. Its fins form wrists, so the Tiktaalik was undoubtedly able to support itself while lying flat against a surface and could propel itself on land. Like fish, Tiktaalik clearly had gills, but the Tiktaalik's discoverers believe the animal's large, interlocking ribs provide compelling evidence that it may have also had lungs. One of the most **telling** differences between Tiktaalik and fish is that Tiktaalik's head was disconnected from its shoulders. In fish, the head is rigidly attached to the shoulder girdle, meaning that fish must maneuver their entire bodies to feed. The challenge of making whole-body maneuvers on land was met in the Tiktaalik by freeing the skull from its bony connection to the body. Tiktaalik's jaw, on the other hand, remained very fishlike. Thus, it may have been suitable for catching prey both in and out of the water, an important consideration, scientists say, for a transitional species.





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**DIRECTIONS:** Read the following passage and then the questions about it. Decide which of the choices best answers each question, and mark your answers.

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- 7 Based on the fossil record, what are scientists able to determine about the Tiktaalik?

- ☐ It maneuvered its entire body to feed.
- ☐ It ate both plants and animals.
- ☐ It was able to move on land.
- ☐ It laid its eggs in shallow water.

Tiktaalik was a predator with sharp teeth, a crocodile-like head, and a flattened body. Tiktaalik's scales and fins qualify the creature as a fish, but in other ways the animal represented a truly new and unique species for its time. The bones in the fossil's limbs form shoulders and elbows, similar to those found in modern alligators and crocodiles. Its fins form wrists, so the Tiktaalik was undoubtedly able to support itself while lying flat against a surface and could propel itself on land. Like fish, Tiktaalik clearly had gills, but the Tiktaalik's discoverers believe the animal's large, interlocking ribs provide compelling evidence that it may have also had lungs. One of the most telling differences between Tiktaalik and fish is that Tiktaalik's head was disconnected from its shoulders. In fish, the head is rigidly attached to the shoulder girdle, meaning that fish must maneuver their entire bodies to feed. The challenge of making whole-body maneuvers on land was met in the Tiktaalik by freeing the skull from its bony connection to the body. Tiktaalik's jaw, on the other hand, remained very fishlike. Thus, it may have been suitable for catching prey both in and out of the water, an important consideration, scientists say, for a transitional species.



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**DIRECTIONS:** Read the following passage and then the questions about it. Decide which of the choices best answers each question, and mark your answers.

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- 8 Look at the four squares [...] that indicate where the following sentence could be added to the passage.

**In other words, the structure of Tiktaalik's neck enabled it to turn its head.**

Where would the sentence best fit?

Click on a square [...] to add the sentence to the passage.

Tiktaalik was a predator with sharp teeth, a crocodile-like head, and a flattened body. Tiktaalik's scales and fins qualify the creature as a fish, but in other ways the animal represented a truly new and unique species for its time. The bones in the fossil's limbs form shoulders and elbows, similar to those found in modern alligators and crocodiles. Its fins form wrists, so the Tiktaalik was undoubtedly able to support itself while lying flat against a surface and could propel itself on land. Like fish, Tiktaalik clearly had gills, but the Tiktaalik's discoverers believe the animal's large, interlocking ribs provide compelling evidence that it may have also had lungs. One of the most telling differences between Tiktaalik and fish is that Tiktaalik's head was disconnected from its shoulders. In fish, the head is rigidly attached to the shoulder girdle, meaning that fish must maneuver their entire bodies to feed. [...] The challenge of making whole-body maneuvers on land was met in the Tiktaalik by freeing the skull from its bony connection to the body. [...] Tiktaalik's jaw, on the other hand, remained very fishlike. [...] Thus, it may have been suitable for catching prey both in and out of the water, an important consideration, scientists say, for a transitional species. [...]



## Reading

**DIRECTIONS:** Read the following passage and then the questions about it. Decide which of the choices best answers each question, and mark your answers.

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9 The word **it** in the passage refers to

- ☐ the loss of gill flaps
- ☐ the evolution of the Tiktaalik jaw
- ☐ the similarity between the Tiktaalik and other fish
- ☐ the Tiktaalik's discovery

both in and out of the water, an important consideration, scientists say, for a transitional species.

The Tiktaalik's discovery confirms much of what scientists had long believed about how land-based animals evolved, and provides information about the order in which evolutionary changes probably occurred. In addition to the Tiktaalik's unusual combination of fish-like jaw and tetrapod-like neck, scientists also noticed that the creature lacked the bony flaps that most fish have covering their gills. Scientists had long wondered when, in the evolutionary scheme of things, animals had lost this feature. Tiktaalik shows that **it** happened before animals lived on land.

Scientists believe the Tiktaalik may prove to be as important a find as the Archaeopteryx--an animal believed to mark the transition from reptiles to birds. The completeness of the Tiktaalik skeleton means that scientists no longer have to piece together bits of the fossil record, as they had in the past; Tiktaalik gives them a fairly complete picture of an animal that blurs the distinction between fish and land-based tetrapod. It represents a very significant transition at a key moment in evolutionary history.



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**DIRECTIONS:** Read the following passage and then the questions about it. Decide which of the choices best answers each question, and mark your answers.

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10 In paragraph 6, the author mentions the Archaeopteryx to

- ☐ emphasize the significance of the Tiktaalik's discovery
- ☐ demonstrate how scientific theories about evolution have changed
- ☐ show the similarity between early amphibians and reptiles
- ☐ provide more information about the era in which the Tiktaalik lived

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Paragraph is indicated by an arrow ►



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**DIRECTIONS:** Read the following passage and then the questions about it. Decide which of the choices best answers each question, and mark your answers.

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11 According to the passage, what do scientists hope to learn from the Tiktaalik's discovery?

- ☐ Details of the role tectonic shifts played in moving animal species across the planet
- ☐ How the feeding habits of early land animals helped direct evolutionary change
- ☐ More about the evolution of tetrapods from fish ancestors
- ☐ When the transition from reptiles to birds first began

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## Reading

**DIRECTIONS:** Read the following passage and then the questions about it. Decide which of the choices best answers each question, and mark your answers.

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12 The word **blurs** in the passage is closest in meaning to

- ☐ shows
- ☐ complicates
- ☐ increases
- ☐ removes

both in and out of the water, an important consideration, scientists say, for a transitional species.

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## Reading

**DIRECTIONS:** Select the appropriate phrases from the answer choices, and match them with the type of organism to which they relate. TWO of the answer choices will NOT be used. *This question is worth 3 points.*

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13 Drag your answer choices to the spaces where they belong. To remove an answer, click on it. To review the passage, click on **View Text**.

## Fish



## Tiktaalik



Lack bony flaps over the gills

Required to maneuver the entire body when feeding

Head attached to shoulder girdle

Have wrist bones within the fins

Feed mostly on leaves

Have bony tails used mainly for balance

Have interlocking ribs