Aquatic Insects - Text Feature Analysis

Essential Question: How do text features aid a reader's understandings?

Objective: Students will identify text features and explain how they aid in readers' understanding.

Standard(s):
LAFS.6.RI.2.5
Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas.

Materials: Aquatic Insects Bell Work Sheets

Set up: Display facts and questions

Directions: Give students one fact sheet daily, as bell work.

Time: 10 days @ 10 min. each

Assessment: Successful completion of bellwork

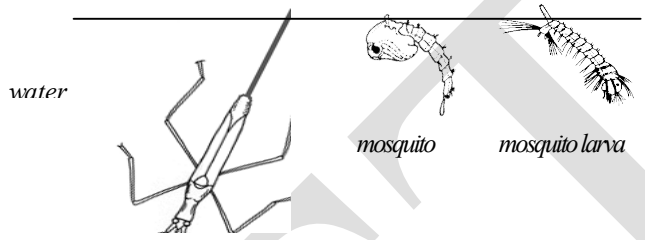
How Do Aquatic Insects Breathe? – Surface Breathing

Many of the insects that you will observe on your trip to Nature's Classroom will be aquatic at some stage in their lifecycle. To survive in this **aquatic** environment, insects have evolved a wide variety of **adaptations**. Many of these adaptations have been to the **respiratory** mechanism of insects.

Some aquatic insects use breathing pores to get oxygen from the air. These are called **spiracles**. Some adult beetles and water bugs come to the surface to allow their spiracles to come in contact with the air. This lets oxygen into their bodies before diving again.

Other aquatic insects utilize a breathing tube called a **trachea**. This is like a snorkel attached to their abdomen. Insects can stick the trachea above the surface of the water to breathe air. The larva stage of flies and the larval and pupal stages of some mosquitoes use tracheas. Adult water scorpions also use a pair of appendages located at the base of their abdomens to create a trachea. This gives them the appearance of a scorpion.

Examples of some aquatic insects using **Trachea**



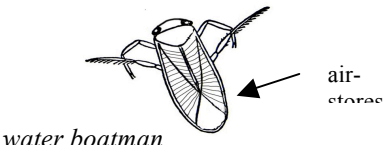
1. Which text feature lets you know what words may be important?

    a. Title
    b. Graphics
    c. Bolded words
    d. Captions

2. Why did the author include the graphic of the water scorpion and the two stages in the life cycle of mosquitos?

How Do Aquatic Insects Breathe? – Storing Air

The occurrence of bubble-like "air-stores" under the wings or on various parts of the body is common among adult true bugs such as the water boatman and various diving beetles. These are used to trap air and bring it under the water.



water boatman

The air stores come in direct contact with the **spiracles**. The air and water interface of an air store acts as a **diffusion** membrane with oxygen entering and carbon dioxide exiting outward into the water.

whirligig beetle

Some beetles, such as the whirligig, use the numerous hairs on their hind legs to trap an air bubble and hold it against their spiracles. In this way they are similar to scuba divers who wear air tanks. The bubble provides an air supply that allows the beetle to stay submerged for a long period of time.

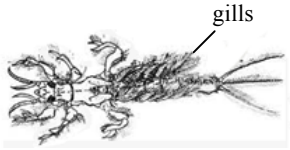
1. The underlined words direct you to what?

   a. The title
   b. The graphics
   c. The index
   d. The captions

2. How do the illustrations connect to the text and aid a reader's understanding?

How Do Aquatic Insects Breathe? – Extracting Oxygen from the Water

Gills are thin membranes that allow gas exchange between an animal's blood and the external environment. Many **larvae** and **nymphs** of aquatic insects possess **filamentous gills**. The gills show an endless variation in size and location, however, gills customarily occur in the **thorax** and abdominal region. Internal muscles vibrate the gills in a shuttle-like manner. The water currents also insure that an adequate oxygen supply continues to move into the gills.



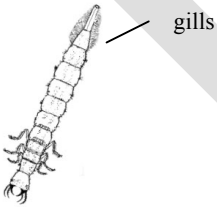
mayfly nymph

The stonefly and mayfly nymphs are both good examples of nymphs with filamentous gills. The larvae of some mosquitoes also breathe through gills.

The slim damselfly nymphs possess three leaf-shaped gills at the tip of their abdomens.

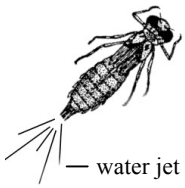
damselfly

The larvae of some predacious diving beetles have gills that resemble thin wings on their abdomens.



predacious diving beetle larva

Dragonfly nymphs have internal gills that are located in a chamber in their abdomen. This breathing style has an added bonus. A dragonfly nymph can jet along underwater by forcefully squirting water out of its abdominal opening.



dragonfly nymph

1. Which part of the graphic identifies the location of the gills?

   a. The caption
   b. The photograph
   c. The title
   d. The label

2. How is the dragonfly nymph both similar to and different from the damselfly and mayfly nymphs?

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How Do Aquatic Insects Breathe?

There are a few **variables** that influence the respiration or oxygen consumption of all aquatic insects. These variables are:

1. Temperature - Warm water holds less oxygen than cold water.

2. Size - In general, larger insects require more oxygen than small ones.

3. Stage in life history - The respiratory mechanism used by an insect may change as it goes through its lifecycle.

4. Genetic makeup of the organism - some organisms have a genetically higher metabolism than others. Therefore, they require more oxygen.

1. Which text feature is being used here?

   a. Graph
   b. List
   c. Index
   d. Glossary

2. How does this feature benefit the reader?

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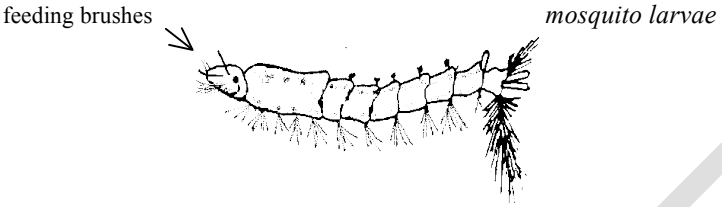
How Do Aquatic Insects Feed? – Brushes and Proboscis

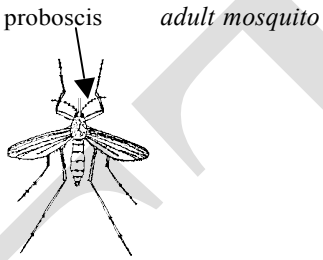
Brushes

One of the most numerous wetland insects which you will come in contact with will be the mosquito. Mosquito larvae eat microscopic plants and animals or organic debris filtered through brushes that surround their mouth. The larvae usually rest just under the surface of the water and can be easily observed if the water remains undisturbed.



Proboscis

The adults have a piercing, sucking mouth-part called a **proboscis**. Only the female mosquitoes are bloodsuckers. The males feed on the nectar of flowers. Many types of mosquitoes require a meal of blood before they are able to lay their eggs. In fact, you may become an unwilling blood donor.



1. What text feature tells what each paragraph is about?

    a. Legend
    b. Graphic
    c. Sub-heading
    d. Heading

2. Why are arrows pointing to certain points on the illustrations?

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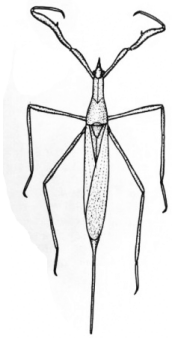
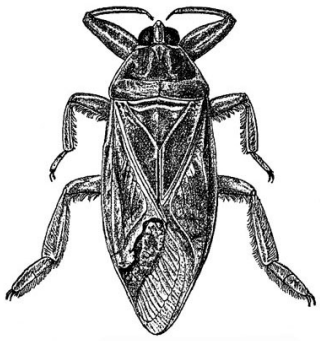
How Do Aquatic Animals Feed? - Grasping and Piercing

Some aquatic insects use a combination of grasping front legs and piercing beaks to kill and eat their prey. Some examples are the water scorpion, belostoma waterbug, the giant waterbug.





1. Which text feature would be **most** helpful to a reader's understanding in this section?

    a. Title page
    b. Label
    c. Index
    d. Vocabulary box

2. Explain why your answer to the question above would be **most** helpful?

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How Do Aquatic Insects Feed? - Extendable "Lips"

Dragonfly and damselfly nymphs are dull-colored creatures that resemble space aliens. They have large extendable mouth parts covered by a scoop-like lip or **labium**. The nymphs live on the bottom of the river and feed on insect larvae, small crustaceans, tadpoles and even small fish.

dragonfly nymph

Labium *– an extendable mouthpart of a dragonfly or damselfly similar to a lower lip. It is extended out from the mouth to snatch prey*

1. Which text feature provides the definition of a word?

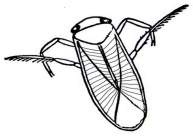
   a. Bolded word
   b. Graphic
   c. Label
   d. Vocabulary box

2. Why might it be important to define certain words for readers?

How Do Aquatic Insects Feed? - Piercing and Sucking

True bugs such as the water boatman and water striders have mouthparts fitted for piercing and sucking. Some adult water boatman feed on algae or on decaying plant and animal matter sucked from the bottom of the river. The water strider lives on the surface film of the water and catches other insets or small crustaceans just beneath or on the water surface.

water boatman *water strider*



1. The title tells me:

    a. I will read about creatures on the surface of the water.
    b. I will read about how aquatic insects feed.
    c. I will read about piercing and sucking insects.
    d. I will read about water boatman.

2. How does a title aid a reader's understanding?

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