Insect

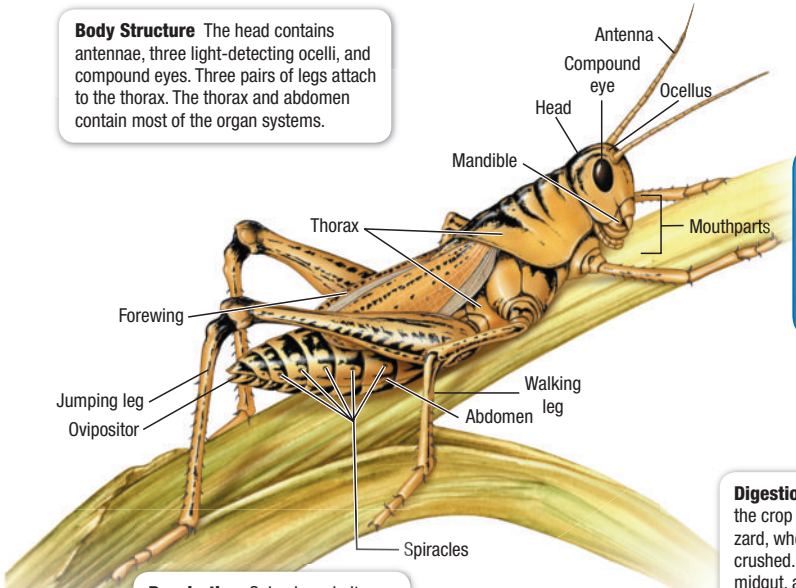
Although the Eastern lubber grasshopper has wings, its wings are too short to be used in flight. Instead, the grasshopper moves by jumping. During the mating season, a male "sings" by rubbing a row of pegs on its jumping leg against ridges on its forewing.

Eastern Lubber Grasshopper

Scientific Name: *Romalea microptera*
Size: 5 cm to 6.5 cm in length
Range: Eastern United States
Habitat: Fields and meadows
Diet: Grasses and other leafy vegetation



Body Structure The head contains antennae, three light-detecting ocelli, and compound eyes. Three pairs of legs attach to the thorax. The thorax and abdomen contain most of the organ systems.

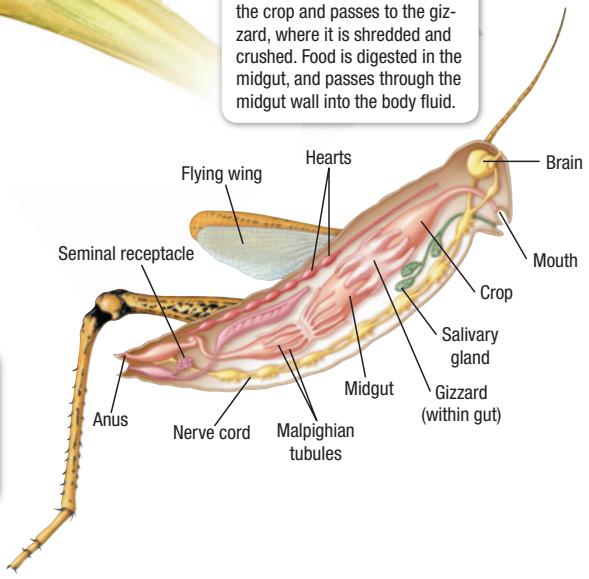


Molting Grasshoppers, like all arthropods, undergo molting. In this photo, the black exoskeleton has been shed during molting.



Digestion Chewed food enters the crop and passes to the gizzard, where it is shredded and crushed. Food is digested in the midgut, and passes through the midgut wall into the body fluid.

Respiration Spiracles admit air to the branched system of tracheae. These structures deliver oxygen throughout the body.



Reproduction The female stores sperm in a seminal receptacle. Later, the female digs a hole by using ovipositors. As she releases her eggs into the hole, the eggs are fertilized by the stored sperm.

Up Close

Teacher's Notes Have students look up grasshoppers in field guides that are used for insect identification. The Eastern lubber grasshopper is a short-horned grasshopper. Longhorned grasshoppers, such as katydids and Mormon crickets, have long, threadlike antennae.

Discussion

1. How do you know this grasshopper is a female? (This grasshopper has an ovipositor and seminal receptacle, which are used to deposit fertilized eggs.)
2. What are the three main sections of a grasshopper's body, and what major body function occurs in each section? (The grasshopper has a head, a thorax, and an abdomen. Touching, smelling, seeing, and chewing occur in the head; walking and jumping occur in the thorax; and respiration, reproduction, and excretion occur in the abdomen.)
3. What would happen if every grasshopper were to freeze during a cold winter? (The species would survive because grasshopper eggs stay dormant in winter and hatch in the spring.)
4. What parts of the digestive system help to physically and chemically break down food? (physical digestion: the labrum, labium, mandible, maxilla, and gizzard; chemical digestion: midgut and coelom.)

Differentiated Instruction

Alternative Assessment

Comparing Body Plans Have students compare the illustrations on pages 710 and 711 to identify the features of insects that are *different* from arachnids and other arthropods. (three body regions with a distinct head, three pairs of legs, compound eye, and wings) LS Visual

Why It Matters

Romance Is in the Air Grasshoppers produce sounds that resemble chirping "songs." Most people don't know that it is generally male grasshoppers that play these songs as part of their courtship behaviors. They generally have a repertoire of three. The initial song attracts the female, and when she comes close, the male plays a more "intimate" melody. However, if another male is close by and competing for the female, the male plays a rivalry song. Some females play no songs in response, while the females of some species respond with short bursts of song.