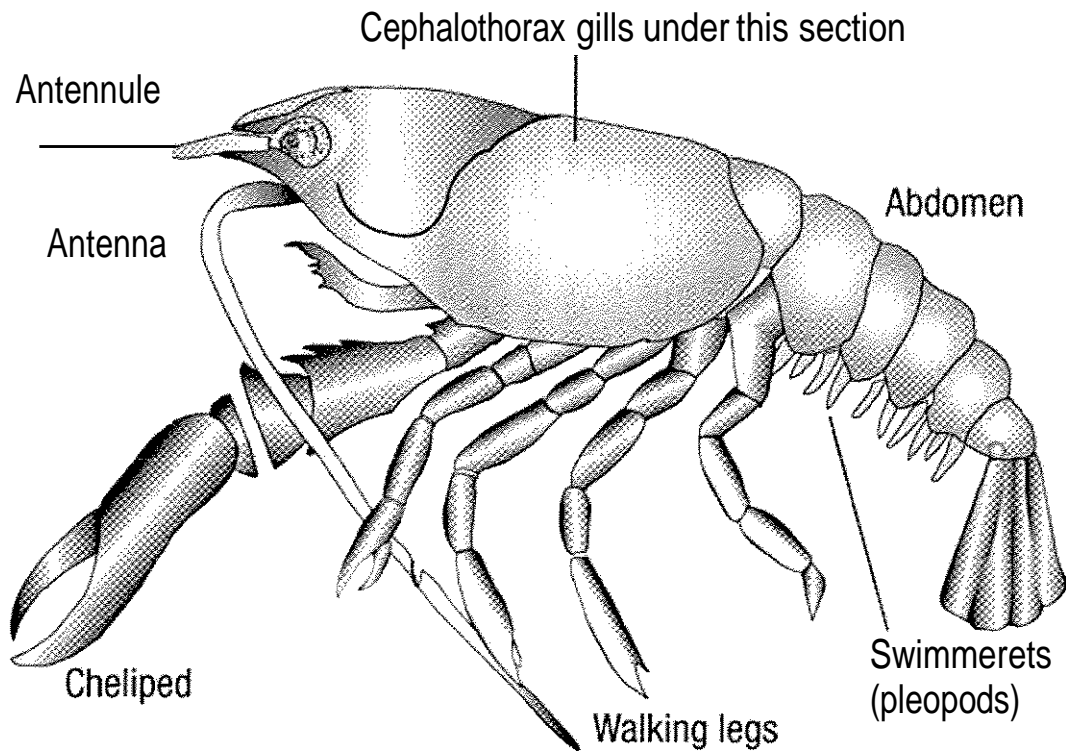


Crayfish Dissection

Materials: gloves, preserved crayfish, paper towel, dissecting pan, scissors, forceps, dissecting needle, dissecting pins, and pen or pencil

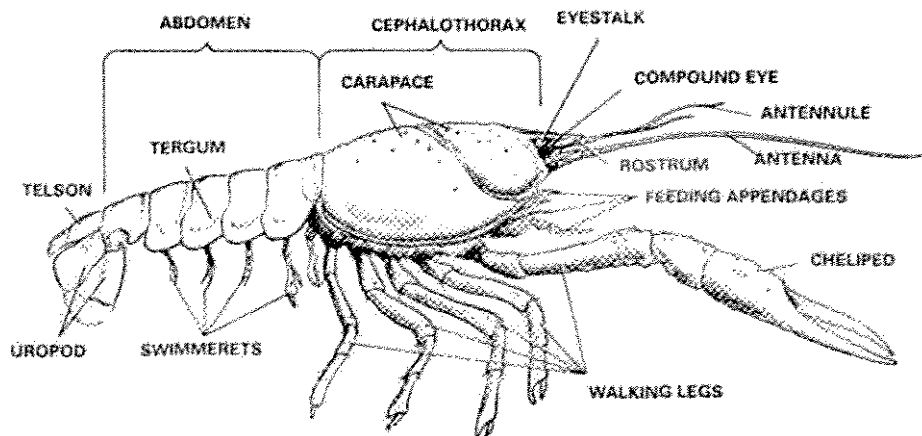
Background:

Like all crustaceans, a crayfish has a fairly hard exoskeleton that covers its body. As shown in the diagram on the next page, its body is divided into two main parts, the cephalothorax and the abdomen. The cephalothorax consists of the cephalic (or head) region and the thoracic region. The part of the exoskeleton that covers the cephalothorax is called the carapace. The abdomen is located behind the cephalothorax and consists of six clearly divided segments. The cephalothorax consists of 3 segments. Each segment of both the cephalothorax and the abdomen contains a pair of appendages. The head (or cephalic) region has five pairs of appendages. The antennules are organs of balance, touch, and taste. Long antennae are organs for touch, taste, and smell. The mandibles, or jaws, crush food by moving from side to side. Two pairs of maxillae hold solid food, tear it, and pass it to the mouth. The second pair of maxillae also helps to draw water over the gills. Of the eight pairs of appendages on the cephalothorax, the first three are maxillipeds, which hold food during eating. The chelipeds are the large claws that the crayfish uses for defense and to capture prey. Each of the four remaining segments contains a pair of walking legs. In the abdomen, the first five segments each have a pair of swimmerets, which create water currents and function in reproduction. The sixth segment contains a modified pair of uropods. In the middle of the uropods is a structure called the telson, which bears the anus. The uropod and telson together make up the tail fan. The crayfish moves *backward* by forcing water forward with its tail fan.



Procedure *Part 1-External/ Anatomy of a Crayfish*

1. Put on gloves. Place a crayfish **dorsal** side up in a dissection tray. Use the diagram below to locate the **cephalothorax** and the **abdomen**. The **carapace**, a shield of chitin, covers the dorsal surface of the cephalothorax. On the carapace, observe an indentation, the **cervical groove**, that extends across the midregion and separates the head and **thoracic regions**. On the thoracic region, locate the prominent suture or indentation on the cephalothorax that defines a central area separate from the sides. Note the individual **segments** of the abdomen



What is the main difference between the cephalothorax and abdomen?

2. Turn the crayfish on its side, and locate the rostrum, which is the pointed extension of the carapace at the head of the animal shown in the diagram above. Beneath the rostrum locate the two eyes. Notice that each eye is at the end of a stalk.
3. Locate the five pairs of appendages on the head region. First locate the antennules in the most anterior segment. Behind them observe the much longer pair of antennae.

Why is it useful to turn the specimen on its side for this part of your study?

4. Locate the mouth. Then observe the mandibles, or true jaws, behind the antennae. Now locate the two pairs of maxillae, which are the last appendages in the cephalic region.

Which appendages in the cephalic region are related to the eating of food?

5. On the thoracic portion of the cephalothorax, observe the three pointed maxillipeds.

How are the maxillipeds related to eating?

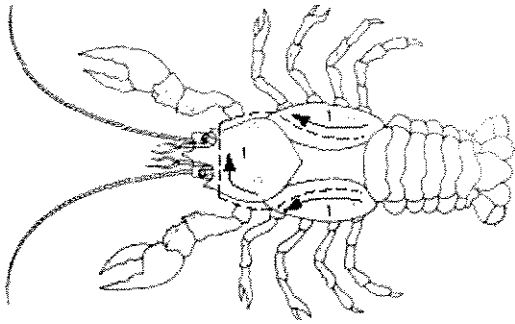
6. Next observe the largest prominent pair of appendages, the chelipeds, or claws. Behind the chelipeds locate the four pairs of walking legs, one pair on each segment.
7. On the abdomen, observe the six distinct segments. On each of the first five segments, observe a pair of swimmerets.
8. On the last abdominal segment, observe a pair of pointed appendages modified into a pair of uropods. In the middle of the uropods, locate the triangular-shaped telson.
9. Now turn the crayfish ventral side up. Observe the location of each pair of appendages from the ventral side.

From which view, dorsal or ventral, can you see the location of the appendages on the segments more clearly?

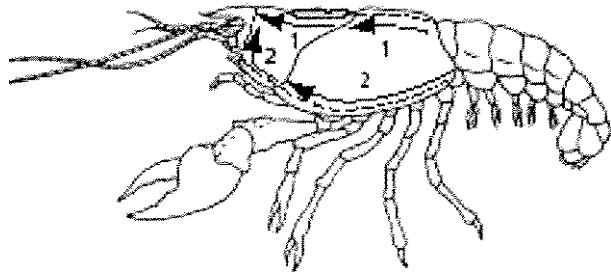
Part 2-Internal Anatomy of a Crayfish

10. Using one hand to hold the crayfish dorsal side up in the dissecting tray, use scissors to carefully cut through the back of the carapace along dissection cut line 1, as shown in the diagram below. Cut along the indentations that separate the thoracic portion of the

carapace into three regions. Start the cut at the posterior edges of the carapace, and extend it along both sides in the cephalic region.



11. Use forceps to carefully lift away the carapace. Be careful not to pull the carapace away too quickly. Such action would disturb or tear the underlying structures.
12. Place the specimen on its side, with the head facing left, as shown in the diagram below. Using scissors, start cutting at the base of cut line 1. Cut along the side of the crayfish, as illustrated by cut line 2. Extend the cut line forward toward the rostrum (at the top of the head).



13. Use forceps to *carefully* lift away the remaining parts of the carapace, exposing the underlying **gills** and other organs.

Crayfish Appendage Table



Appendage	Function	Location	Attach Appendage Here
Antennules	Senses touch & taste; helps crayfish maintain balance	in front of the mouth	
Antenna	Senses touch and taste	in front of the mouth	
Mandible or jaw	Crushes food	mouth	
First Maxilla	Moves food to the mouth	behind the mandibles.	
second maxilla	moves water in the gill chamber	behind the mandibles.	
First maxilliped	Holds food; Senses touch and taste	at ventral and forward part of the thorax region	
Second maxilliped	Holds food; Senses touch and taste	at ventral and forward part of the thorax region	
Third maxilliped	Holds food; Senses touch and taste	at ventral and forward part of the thorax region	
Cheliped	Grasps food	at ventral part of thorax-posterior to the maxillipeds	
walking leg	locomotion	at ventral part of thorax-posterior to the maxillipeds	
Swimmeret	1st swimmeret in males transfers sperm to female; females use the 2nd-5th swimmerets to hold eggs & young; locomotion	abdominal region on the ventral side	

uropod	swimming	posterior or tail end .
telson	swimming	posterior or tail end .

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Name l-----
Group _____ **Date** _____ **Period**'-----



Crayfish Dissection Worksheet

1. What structures are used for capturing prey and securing and eating food?
2. How are the antennae, chelipeds, other walking legs, and swimmerets related?
3. What are the main structures you could have observed when you removed the exoskeleton of the abdomen and tell the function of each?
4. Is the crayfish most vulnerable to its enemies from the dorsal or ventral side? Why?
5. The crayfish usually molts, or sheds its exoskeleton, twice a year. Why does the crayfish "hide" after it molts?
6. Name the appendages found on the head of a crayfish & tell the function of each.

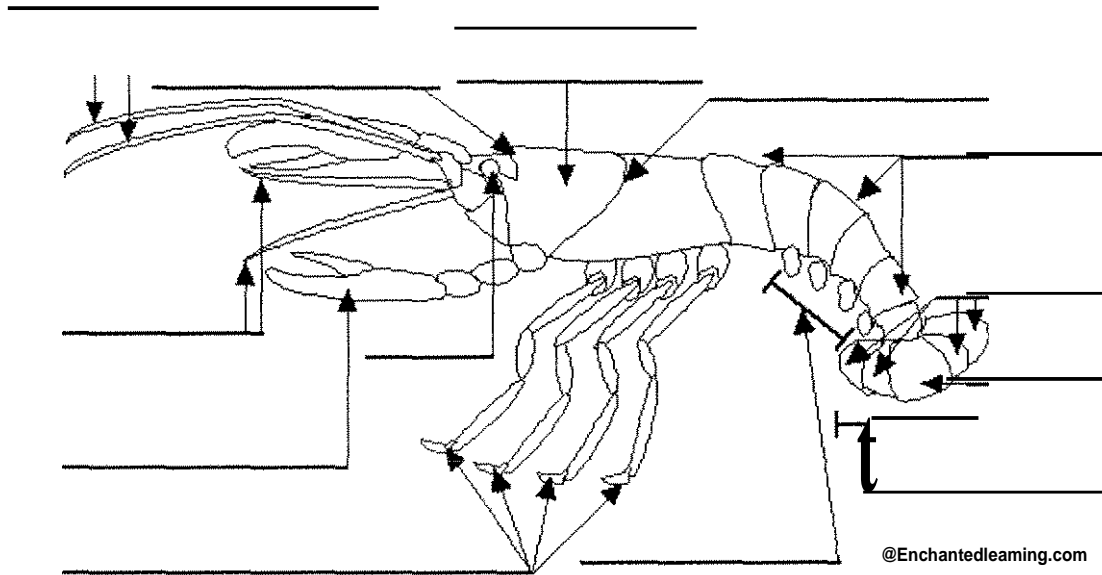
7. Of the systems studied, which two are most unlike the related human system? Why?

8. Although the crayfish has an inflexible cephalothorax, the crayfish is classified as a segmented animal. Why?

9. Name the appendages found on the thorax of the crayfish and tell the function of each.

10. Name the appendages on the abdomen of the thorax and tell the function of each.

11. Label the drawing of the crayfish.



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