

Showdown At Crayfish Corral



Objective

By observing dominance behavior displayed by crayfish, students will be able to describe the concept of dominance and hierarchy displayed by other animals.

Materials

- crayfish (available at aquarium stores, biological supply companies, or bait shops)
- plastic containers at least 18 in. by 24 in. by 8 in. deep
- water to fill containers half way (bottled drinking water or de-chlorinated tap water)
- rulers
- clipboards
- pencils
- copies of crayfish behavior log sheets
- small clay flower pots (must sink)
- food (meal worms, peas, and/or corn)
- aluminum pans (ex. mini loaf tins)

Background

Dominance and hierarchy can be observed in the behavior of many animals. For example, in spotted hyena (*Crocuta crocuta*) clans the females are always dominant over males. In fact, the highest ranked male is lower than the lowest ranked female. And the highest female's offspring is dominant over the all females and males. There is even fighting among pups. The young, usually twins, are born with a complete set of teeth. If the young are the same sex, one will kill the other after birth in order to assure its place in the hierarchy. Hyenas live in savanna, desert, and mountain side habitats, south of Sahara, except southern South Africa and Congo Basin. Hyenas hunt wildebeest, zebra, Thomson's gazelle, Grant's gazelle, topi, and buffalo.

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Action

1. Before beginning activity, fill pools with water, set out small pans, flower pots, rulers, clipboards, and crayfish food. Keep crayfish in a separate container. Copy crayfish handouts.
2. Divide class into three groups. Each group should have about 10 students.
3. Distribute crayfish handouts. Assign one container per student group and one crayfish per two students.
4. Place each crayfish in a small pan with a little water. Using the handout, ask student pairs to identify the parts of the crayfish, determine the sex, and any distinguishing characteristics. Record the length of the carapace and the claws.
5. Within each student group, have students compare crayfish and hypothesize which crayfish is more dominant. Write behavior predictions on worksheet.
6. Place flower pots in container, one less than the number of crayfish. Introduce crayfish one at a time. Wait at least one minute before introducing additional crayfish.
7. After all crayfish are introduced, students should observe for five minutes, then record their findings by writing and drawing the behavior.
8. Ask students to hypothesize outcomes if another shelter is removed. Record predictions and remove another flower pot. Observe for five minutes and record findings by writing and drawing the behavior.
9. Ask students to predict behavior outcome if food is introduced. Write predictions. Introduce a few pieces of food. Observe for five minutes and record findings by writing and drawing the behavior.
10. Have students discuss outcome and write their conclusions. Were any predictions correct? If time permits, discuss as a class, comparing outcomes with each student group. Ask students if they know of other animals that exhibit dominance behavior.

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For each round draw the crayfish and their shelters in each pool.

Round #1



Number of crayfish

Number of shelters

Number of
dominant crayfish

Hypothesis:
What do you think
will happen?

What did happen?

Round #2



Number of crayfish

Number of shelters

Number of
dominant crayfish

Hypothesis:
What do you think
will happen?

What did happen?

Round #3



Number of crayfish

Number of shelters

Number of
dominant crayfish

Hypothesis:
What do you think
will happen?

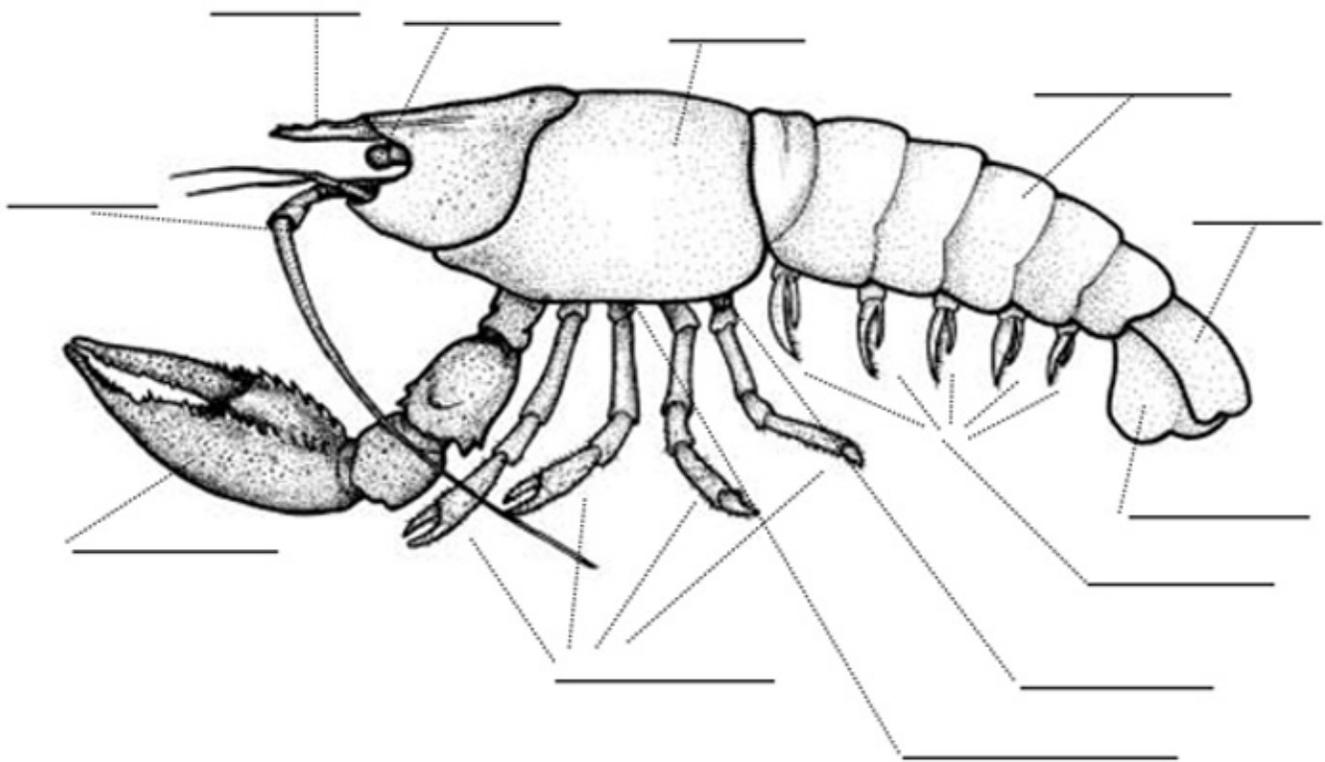
What did happen?

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BASIC CRAYFISH ANATOMY

Label the diagram below.



WORD BANK: rostrum, eye, antennae, thorax, cheliped, walking legs, male gonopore, female gonopore, abdomen, swimmerets, uropod, telson

CRAYFISH BEHAVIORS

Here are some quick explanations of what behaviors you might see and what researchers think that they mean.

- **Sleeping:** Just like us, sometimes a crayfish just has to rest.
- **Investigative Behavior:** The crayfish will use their antennae to explore their new environment.
- **Escape Behavior:** When a crayfish is attempting to escape, it will flip its tail.
- **Merel Spread:** When crayfish meet each other, they greet each other by touching claws.
- **Defense Posture:** This is what the crayfish will do when they are feeling threatened. The crayfish will fold its abdomen under and rear back with its chelipeds (claws) up in the air. This says "Leave me alone!"
- **Wrestling:** This behavior occurs during fighting. Crayfish will lock claws.
- **Established Dominance:** After a fight, the winner will tower over the loser, showing that they are dominant.

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CRAYFISH CONCLUSIONS

1. Do males or females appear more dominant?

2. Do the males and female fight?

3. Do they fight over resources?

4. What area of the pool did the most dominant individual occupy?

5. Describe the most dominant individual and their behavior.

6. What occurred when food was involved?
