Certification-Board

ISEE

Independent School Entrance Examination

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**QUESTION:** 345
In setting up an aquarium, several factors must be considered before introducing fish. Which of the following factors could be tested using litmus paper?

A. salinity  
B. acidity  
C. chlorination  
D. temperature

**Answer:** B

**QUESTION:** 346
The complex behavior of the poor-sighted, three-spined male stickleback fish has been studied extensively as a model of species behavior in courtship and mating. After a male has migrated to a suitable spot, he builds a spawning nest of sand and sediment. In courting, he performs a special "zigzag" dance. The female then follows the male to the nest where she spawns and he fertilizes the spawned eggs. Also, male sticklebacks have been shown to exhibit territorial behaviors. A biologist performed three experiments to learn more about the behavior of the stickleback. Experiment 1 Tank 1 and Tank 2 are set up with identical conditions and one male stickleback is placed in each tank. Both fish build nests in their respective tanks. The male from Tank 1 is removed from his tank and is replaced with an egg-laden female; the male from Tank 2 is removed from his tank and is introduced into Tank 1. In Tank 1, the male does not perform the zigzag dance and no spawning occurs. The male retreats to a corner of the tank. Experiment 2 A male stickleback in an aquarium builds his nest. A fat, round male is introduced into the environment. The original male performs the zigzag dance and attempts to lead the round male to the nest. The round male refuses and begins to flap his fins and swim in circles. The first male then begins to flap his fins, circle his nest, and occasionally prod the other fish to a far corner of the tank. Experiment 3 A small, flat-shaped female is introduced into a tank where a male has built a nest. The male circles the female a few times, and then retreats to a corner of the tank.

The experimental data would support the hypothesis that the purpose of the male stickleback's mating dance is to:

A. keep away other male sticklebacks.  
B. fertilize the eggs.  
C. lure and entice the female to the nest  
D. establish territorial rights.

**Answer:** C

**QUESTION:** 347
Based on observations from the above experiments, which factor initially stimulates the male to do the zigzag dance?

A. The physical environment.
B. The shape of the fish.
C. The number of fish in the tank.
D. The sex of the fish.

**Answer:** A

**QUESTION:** 348
Which experiment supports the hypothesis that the male exhibits territorial behavior?

A. 1 only.
B. 2 only.
C. 1 and 2 only.
D. 1, 2, and 3.

**Answer:** C

**QUESTION:** 349
To further investigate the territorial behavior of the stickleback, the biologist should vary which of the following factors in Experiment 2?

A. The temperature of the water.
B. The fatness of the male fish.
C. The sediment and sand in the tank.
D. The size of the tank.

**Answer:** D

**QUESTION:** 350
To clarify the results of Experiment 1, the biologist should set up which of the following test situations?

A. Maintain the positions of the male sticklebacks and add another egg-laden female to Tank 1.
B. Place both male sticklebacks in Tank 2.
C. Return the original male stickleback to Tank 1 and observe its behavior with the female fish.
D. Repeat the experiment using a different species of fish.

**Answer:** C

**QUESTION:** 351
A male stickleback has been established in an aquarium and has built a nest. If one egg-laden female and several flat-shaped male sticklebacks are placed in the tank, one would most likely observe:

A. all the males would perform the zigzag dance.
B. all the males would circle the female.
C. only the male that was originally in the tank would perform the zigzag dance.
D. the female would retreat to a corner.

**Answer:** C
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