



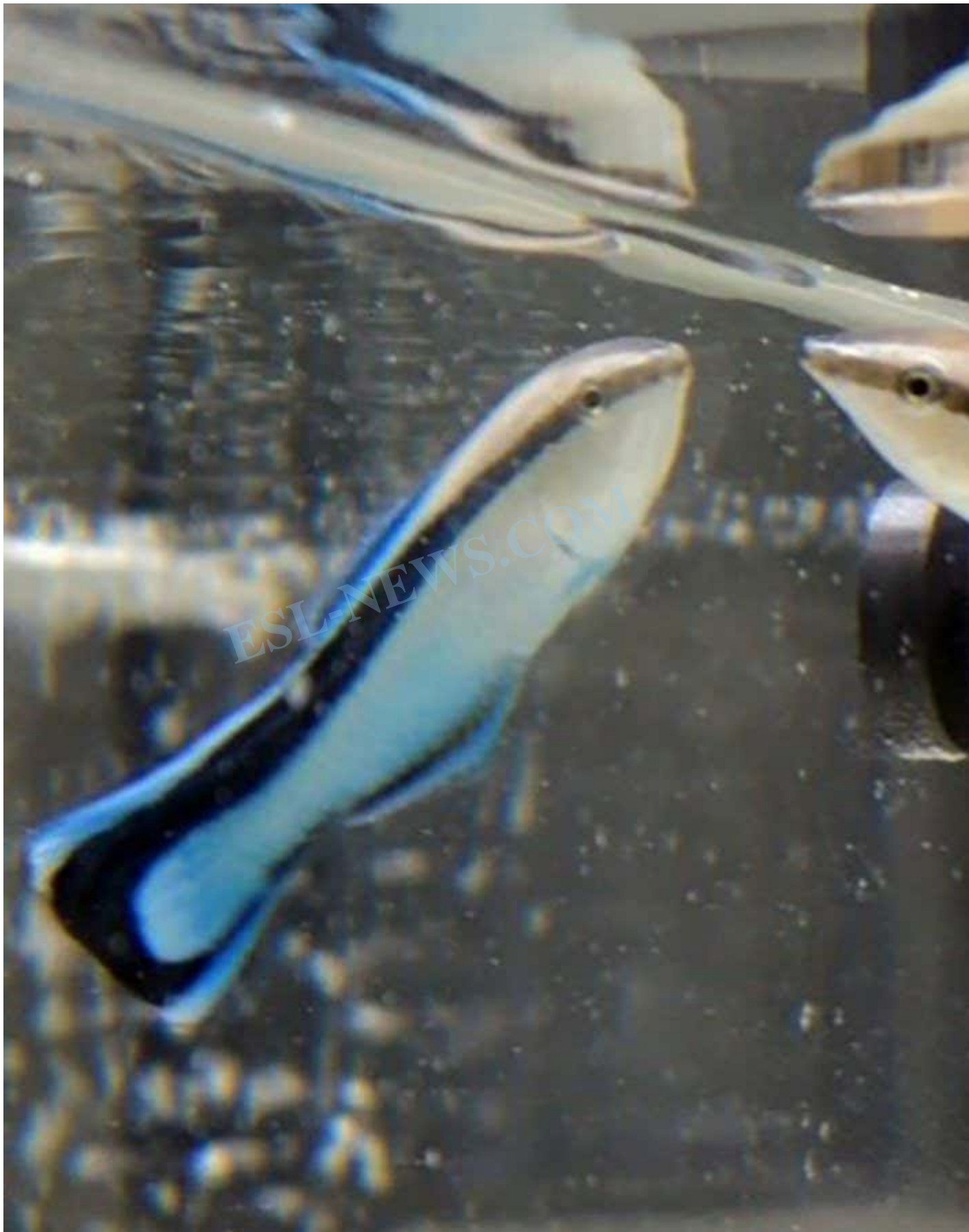
Mirror-Match: Fish Assess Size for Fight Victory

Description

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A bluestreak cleaner wrasse checking itself out in the mirror

Osaka Metropolitan University

Before engaging in a confrontation with another fish, cleaner wrasse engage in a peculiar ritual of self-assessment by studying their own reflection in a mirror.

Bluestreak cleaner wrasse, scientifically known as *Labroides dimidiatus*, display a remarkable level of intelligence. These diminutive coral reef inhabitants were the first fish species to pass the mirror test, signifying their ability to recognize their own reflection. Recent studies reveal that these wrasse utilize their mirror image to create a mental representation of their body size, enabling them to compare and contrast with others.

Researchers, led by [Taiga Kobayashi](#) from Osaka Metropolitan University, conducted experiments to evaluate the fish's aggression levels. When presented with images of other wrasse differing in size, the territorial wrasses consistently initiated aggression, yet their response altered when a mirror was introduced. The fish exclusively engaged in battle with smaller mirror reflections, defying previous assumptions.

By refining their decision-making process through the mirror, cleaner wrasse display cognitive abilities beyond their evolutionary expectations. Understanding self-identity and size comparison in the absence of mirrors showcases their adaptive intelligence, proving their capability to utilize external reflections for strategic advantage.

Topics:

Vocabulary List:

1. **Confrontation** /ˌkɒn.frʌn'teɪ.ʃən/ (noun): A hostile or argumentative meeting or situation between two or more parties.
2. **Peculiar** /pɪ'kjuː.li.ər/ (adjective): Strange or odd; unusual.
3. **Signifying** /'sɪɡ.nɪ.faɪ/ (verb): To be an indication of; to mean.
4. **Territorial** /ˌtɛrɪ'tɔːriəl/ (adjective): Pertaining to the ownership or defense of a specific area.
5. **Cognitive** /'kɒɡ.nɪ.tɪv/ (adjective): Relating to the mental processes of perception memory judgment and reasoning.
6. **Adaptive** /ə'dæp.tɪv/ (adjective): Having the ability to adjust to new conditions.

Comprehension Questions



Multiple Choice

1. What do cleaner wrasse do before engaging in a confrontation with another fish?

- Option: Study their own reflection in a mirror
- Option: Hide behind rocks
- Option: Swim away quickly
- Option: Change their colors

2. Which fish species was the first to pass the mirror test according to the text?

- Option: Bluestreak cleaner wrasse
- Option: Swordfish
- Option: Goldfish
- Option: Angelfish

3. What is the scientific name for bluestreak cleaner wrasse?

- Option: Labroides dimidiatus
- Option: Clownfish
- Option: Parrotfish
- Option: Pufferfish

4. Which university was Taiga Kobayashi from?

- Option: Osaka Metropolitan University
- Option: Harvard University
- Option: Stanford University
- Option: Oxford University

5. What do cleaner wrasse utilize their mirror image for?

- Option: To create a mental representation of their body size
- Option: To catch their prey
- Option: To communicate with other fish
- Option: To build nests

6. How do cleaner wrasse display cognitive abilities according to the text?

- Option: By utilizing external reflections for strategic advantage
- Option: By swimming in schools
- Option: By hiding from predators
- Option: By changing their colors



Answer

Multiple Choice: 1. Study their own reflection in a mirror 2. Bluestreak cleaner wrasse 3. Labroides dimidiatus 4. Osaka Metropolitan University 5. To create a mental representation of their body size 6. By utilizing external reflections for strategic advantage

Vocabulary quizzes

Multiple Choice (Select the Correct answer for each question.)

1. Which term refers to a hostile disagreement or face-off between individuals or groups?
Option: A) Confrontation
Option: B) Therapy
Option: C) Exploration
Option: D) Well-being
2. Which term relates to mental processes such as thinking reasoning and problem-solving?
Option: A) Correlate
Option: B) Cognitive
Option: C) Independence
Option: D) Duration
3. Which term refers to the state of being free from external control or support?
Option: A) Innovative
Option: B) Independance
Option: C) Exertion
Option: D) Signifying
4. Which term means to make the best or most effective use of a situation or resource?
Option: A) Utilization
Option: B) Optimize
Option: C) Resilient
Option: D) Peculiar
5. Which term describes an option or choice that can be substituted for another?
Option: A) Alternative
Option: B) Territorial
Option: C) Acidity
Option: D) Gameplay



6. Which term refers to the specific way in which players interact with a game?

- Option: A) Pneumonia
- Option: B) Gameplay
- Option: C) Ambitions
- Option: D) Cease

7. Which term refers to the treatment of physical or psychological disorders?

- Option: A) Electrolyte
- Option: B) Therapy
- Option: C) Duration
- Option: D) Engaged

8. Which term means introducing new ideas methods or products?

- Option: A) Inception
- Option: B) Innovation
- Option: C) Transitional
- Option: D) Microtransactions

9. Which term refers to small in-game purchases made with real money?

- Option: A) Duration
- Option: B) Microtransactions
- Option: C) Cease
- Option: D) Correlate

10. Which term describes strong desires and determination to achieve success?

- Option: A) Transition
- Option: B) Optimize
- Option: C) Ambitions
- Option: D) Adaptive

Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)

11. Efficient _____ of resources is essential for sustainable development.

12. The movie had a running _____ of over two hours.

13. She proved to be _____ in the face of adversity bouncing back from challenges.

14. Physical _____ during the gym session left him feeling exhausted.

15. Studies show a direct _____ between regular exercise and improved health.



16. Animals often display _____ behavior when protecting their nesting sites.
17. The antique clock had a _____ design unlike any other in the collection.
18. The doctor advised reducing the consumption of foods high in _____ to improve digestion.
19. She made a conscious _____ to learn a new language over the summer.
20. The heavy rainfall caused the river to _____ its banks leading to flooding.

Matching Sentences (Match each definition to the correct word from the vocabulary list.)

21. The audience was fully in the riveting storyline of the movie.
22. The _____ of the idea can be traced back to a brainstorming session last year.
23. The company prides itself on its approach to product development.
24. The team is currently in a period of _____ as they switch focus to a new project.
25. The workshop aimed to inspire young _____ to pursue their business ideas.
26. Regular exercise and a balanced diet are essential for maintaining good _____.
27. The species showed remarkable traits in response to changes in their environment.
28. The team set out on an exciting _____ of the uncharted territory.
29. The elderly patient was hospitalized due to severe _____ and respiratory distress.
30. His grand _____ led him to establish a successful business empire.

Answer

Multiple Choice: 1. A) Confrontation 2. B) Cognitive 3. B) Independence 4. B) Optimize 5. A) Alternative 6. B) Gameplay 7. B) Therapy 8. B) Innovation 9. B) Microtransactions 10. C) Ambitions

Gap-Fill: 11. utilization 12. duration 13. resilient 14. exertion 15. correlate 16. territorial 17. peculiar 18. acidity 19. endeavor 20. cease

Matching sentence: 1. Engaged 2. Inception 3. Innovative 4. Transition 5. Entrepreneurs 6. Well-being 7. Adaptive



8. Exploration 9. Pneumonia 10. Ambitions

CATEGORY

1. Sci/Tech - LEVEL4

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