

Nature's Game Theory

Game Theory In Biology · Practice Test · 15 Questions

1. What strategy is demonstrated when bats share blood meals with unsuccessful foragers, expecting a future return favor?

- A) The Prisoner's Dilemma
- B) Reciprocal Altruism
- C) The Hawk-Dove Game
- D) Zero-Sum Competition

2. In the 'Hawk-Dove' game, what does the 'Hawk' strategy represent?

- A) Aggressive fighting for resources
- B) Passive sharing of food
- C) Seeking a mate through song
- D) Running away from predators

3. Which term describes a strategy that, if adopted by a population, cannot be invaded by any competing alternative strategy?

- A) Dominant behavior
- B) Evolutionarily Stable Strategy
- C) Cooperative equilibrium
- D) Maximum foraging efficiency

4. Why do cleaner fish engage in mutualistic interactions with larger 'client' fish?

- A) To escape predators
- B) To gain food while cleaning parasites
- C) To mark territory
- D) To practice courtship

5. What is the primary result of the 'Tragedy of the Commons' in an overgrazed ecosystem?

- A) Increased biodiversity
- B) Resource depletion
- C) Rapid plant regrowth
- D) Genetic diversity gain

6. In biology, what is 'signaling' typically used for in a competitive game?

- A) To confuse predators
- B) To convey information about fitness or territory
- C) To camouflage against backgrounds
- D) To find water sources

7. Which animal behavior is a classic example of a 'tit-for-tat' interaction?

- A) Sunbathing on rocks
- B) Grooming others who groom you
- C) Hibernate alone in winter
- D) Grazing on grass

8. What is the main benefit of schooling behavior in fish according to game theory models?

- A) Increased individual speed
- B) Improved detection of and protection from predators
- C) Easier egg laying
- D) Better communication with other species

9. What does a 'zero-sum' game imply in a natural setting?

- A) Both individuals benefit equally
- B) One individual's gain is exactly equal to another's loss
- C) No one wins the competition
- D) The population remains stable

10. Why do some birds perform 'mobbing' behavior against predators?

- A) To show off feathers
- B) To distract and deter the predator collectively
- C) To signal to potential mates
- D) To protect their nest from storms

11. What type of strategy is 'kin selection' in social insects like ants?

- A) Self-interest only
- B) Altruism to favor genetic relatives
- C) Aggressive territory defense
- D) Random migration

12. In the context of animal conflict, what is a 'convention' used to avoid injury?

- A) Fighting to the death every time
- B) Using displays to settle disputes without physical harm
- C) Sharing resources equally at all times
- D) Avoiding all social contact

13. What is the 'Prisoner's Dilemma' often used to model in animal social groups?

- A) Cooperation vs. defection
- B) The speed of evolution
- C) Climate adaptation
- D) Sleep patterns

14. When two wolves share a kill, what type of biological interaction is being modeled?

- A) Mutualism
- B) Parasitism
- C) Commensalism
- D) Competition

15. Which concept explains why animals often evolve bright warning colors to signal toxicity to predators?

- A) Costly signaling
- B) Neutral mutation
- C) Random drift
- D) Passive observation