

Safety in Numbers

Evaluate evidence about coordinated animal behavior.

HS-LS2-8 "Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce. Clarification Statement: Emphasis is on: (1) distinguishing between group and individual behavior..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each description of group behavior, and circle each observation or test result used as evidence. Write I beside evidence about an individual's survival and S beside evidence about species survival or reproduction.

When Animals Act Together

- ① At a coastal lagoon, silverside fish often swim in a school, turning at nearly the same moment. This is group behavior because several fish coordinate their movement. A single fish darting toward a shrimp is individual behavior, even if other fish are nearby. Schooling can change an individual's chance of survival. Many fish scan in different directions, so a predator may be noticed sooner. A dense, moving school can also make it harder for a predator to track one target. These benefits do not mean every school is safe. Crowding can increase competition for food and may attract predators.
- ② Evidence for these ideas comes from observations and controlled tests. In observations, fish near the edge of a school are more often attacked than fish in the center, which supports the idea that position in a group can affect individual risk. In controlled experiments, scientists have shown a model predator to fish kept alone or in groups. Groups often respond to the threat more quickly than lone fish. Faster response is evidence, not proof by itself, that schooling can help individuals avoid attack. To evaluate the claim, ask what was compared, what outcome was measured, and whether another explanation could fit the result.
- ③ Group behavior can also affect reproduction. African wild dogs hunt cooperatively and group members bring food back to pups at a den. A hunting group may capture prey that would be difficult for one dog to catch, while pup feeding gives young dogs energy to grow. Field researchers can compare pack size, hunting success, pup survival, and the number of pups that later join the population. If packs with enough helpers feed more pups and those pups survive, that pattern supports a link between cooperation and species survival. However, a careful argument also considers rainfall, prey supply, disease, and habitat, because these factors can affect the same outcomes.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Which action in paragraph 1 is individual behavior, and what feature makes it individual rather than group behavior?

2 Give two pieces of evidence from paragraph 2 that support the claim that schooling can lower an individual fish's risk from predators.

3 Why should a scientist avoid concluding that the faster group response proves that schooling prevents attacks?

4 What pattern would support a link between cooperative behavior and species survival in African wild dogs? Name one non-cooperation factor that should also be considered.

3 YOUR TURN _____ Your own words

Researchers compared tern colonies. In colonies that actively mobbed a model gull, 72 percent of nests hatched at least one chick, compared with 45 percent in colonies with little mobbing. The colonies also differed in vegetation cover. In exactly three sentences, identify the group behavior, make a claim about individual and species survival or reproduction, and evaluate the evidence using both the numbers and the vegetation difference.

PART 1 • READ AND MARK

Underline each description of group behavior, and circle each observation or test result used as evidence. Write I beside evidence about an individual's survival and S beside evidence about species survival or reproduction. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Which action in paragraph 1 is individual behavior, and what feature makes it individual rather than group behavior?	A single fish darting toward a shrimp is individual behavior because one fish acts without coordinating its movement with other fish.
2	Give two pieces of evidence from paragraph 2 that support the claim that schooling can lower an individual fish's risk from predators.	Fish near the edge of a school are attacked more often than fish in the center, and groups respond to a model predator more quickly than fish kept alone.
3	Why should a scientist avoid concluding that the faster group response proves that schooling prevents attacks?	Faster response is only one measured outcome, not direct proof of avoiding attacks, and another explanation could fit the result.
4	What pattern would support a link between cooperative behavior and species survival in African wild dogs? Name one non-cooperation factor that should also be considered.	Packs with enough helpers would feed more pups and those pups would survive or later join the population. Accept rainfall, prey supply, disease, or habitat as another factor.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Adults mobbing a gull model is group behavior because several terns act together to drive away a threat. The higher hatching rate in colonies that mobbed, 72 percent compared with 45 percent, supports the claim that mobbing can raise individual chick survival and may increase the species' future reproduction. However, vegetation cover could also affect nest success, so the comparison alone does not prove that mobbing caused the difference.

Accept logically supported claims that distinguish coordinated group behavior from an action by one individual. Responses should cite the provided evidence and recognize that other variables can limit a causal conclusion.