# Reef Relationship Detectives

Use field observations to defend claims about species interactions.

**FB.6.6** "Engage in scientific argument from evidence to distinguish organisms that exist in symbiotic (mutualism, parasitism, commensalism) or co-evolutionary (predator-prey, cooperation, competition, and mimicry) relationships within ecosystems."

NAME _____ DATE _____

## 1 READ AND MARK

Read it twice

**YOUR JOB** Underline evidence that an organism gains something, circle evidence of harm or no measured change, and number two details that show one fish resembles another.

### Field Notes from a Reef

1. At a reef cleaning station, a small wrasse hovers above a coral head. A dark stripe runs along its side, and it bobs up and down. Larger fish approach, stop swimming, and hold their mouths or gill covers open. The wrasse enters briefly and picks tiny animals from their skin and gills. In videos taken before and after visits, several visitors have fewer visible parasites when they leave. The wrasse swallows the animals it removes. Some visitors could eat the wrasse, but researchers did not record a strike during these visits.

2. Nearby, a fangblenny has a dark side stripe and bobs as it approaches larger fish. One visiting fish holds still as the fangblenny nears its gills. Instead of entering the gill opening, the fangblenny bites off a piece of the visitor's skin and swims away with it. The visitor jerks, then darts into the coral. In repeated observations, visitors bitten by fangblennies have small wounds; the fangblennies gain food. Researchers recorded the appearance and actions of both small fish during one month, but they did not trace changes in either species across generations.

3. On the same reef, a remora clings to a passing shark with a disk on its head. When the shark tears apart a fish, the remora grabs floating scraps. Observers see no bite marks on the shark where the remora rides. Over several weeks, sharks carrying remoras and sharks without them show similar swimming speeds and similar numbers of visible skin parasites. In another patch of reef, a grouper lunges at a damselfish and swallows it. The field team measured no changes in these populations across generations; its notes record behavior, appearance, and short-term outcomes.

## 2 ANSWER WITH EVIDENCE

Use the passage

1. Is the interaction between the wrasse and its visitors best classified as mutualism or parasitism? Use one observation about each organism to support your claim.

2. Is the fangblenny's interaction with a visitor best classified as mutualism or parasitism? Use evidence about both fish.

3. What evidence supports a claim that the fangblenny uses mimicry? Why do these records not establish that the two small fish coevolved?

4. Is the remora's interaction with the shark better supported as commensalism or mutualism? Cite evidence about each organism and state one limit of the observations.

## 3 YOUR TURN

Your own words

In a grove, two bird species use the same scarce nesting holes. When both species nest there, each raises fewer chicks than it does in groves where it nests alone. Name the relationship, then use both observations to distinguish it from cooperation.

ANSWER KEY

# Reef Relationship Detectives

HIGH SCHOOL · FB.6.6

## PART 1 · READ AND MARK

Underline evidence that an organism gains something, circle evidence of harm or no measured change, and number two details that show one fish resembles another. Accept any marking that follows this job and points at the right text.

## PART 2 · ANSWERS

| # | QUESTION | ANSWER |
|---|---|---|
| 1 | Is the interaction between the wrasse and its visitors best classified as mutualism or parasitism? Use one observation about each organism to support your claim. | **Mutualism. The wrasse eats the animals it removes, and several visitors leave with fewer visible parasites.** |
| 2 | Is the fangblenny's interaction with a visitor best classified as mutualism or parasitism? Use evidence about both fish. | **Parasitism. The fangblenny gains food by biting off skin, while the visitor is left with a wound.** |
| 3 | What evidence supports a claim that the fangblenny uses mimicry? Why do these records not establish that the two small fish coevolved? | **The fangblenny resembles the wrasse in its stripe and bobbing approach, and a visitor holds still near it. The records cover only one month and do not trace changes in either species across generations.** |
| 4 | Is the remora's interaction with the shark better supported as commensalism or mutualism? Cite evidence about each organism and state one limit of the observations. | **Commensalism is better supported: the remora gets food scraps, while the measured shark traits are similar with or without remoras. Those measurements cannot rule out every possible effect on the shark.** |

## PART 3 · YOUR TURN (SAMPLE ANSWER)

This is competition because the two species use the same scarce nesting holes. Each raises fewer chicks when the other species is present than when it nests alone. Cooperation would involve a benefit from their interaction, but the observed outcome is worse for both.

Accept claims supported by the stated observations, including cautious wording about the shark's unmeasured outcomes. For mimicry, students should distinguish evidence of resemblance from evidence of evolutionary change across generations.