

## Teacher Guide

# Reproductive Advantage in Sticklebacks

## Plausible Arguments

### Abstract

Students read through and discuss arguments about which fish may have a reproductive advantage in Loberg Lake. After matching evidence and reasoning and selecting the best arguments, they make a claim about whether low-plated sticklebacks have a reproductive advantage in Loberg Lake.

### Learning Objectives

- Organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.
- (Argumentation) In a scientific argument:
  - A claim is a statement or conclusion that answers a scientific question.
  - Evidence is data or observations that support a claim.
- (Argumentation Practice) Identify the claim that is consistent with a given line of reasoning.
- (Argumentation Practice) Match evidence to reasoning and identify plausible arguments.

### Estimated time

45 minutes

### Materials

- Student handouts (includes Reasoning pages and Evidence cards), **single-sided copies**: One per pair or group of students
- Tape, staples, or glue (standard version only)
- Natural Selection Checklist: Each student should already have a copy. (Students will record information there at the end of this activity.)

### Standard instructions

1. Give handouts to each pair or group of students.  
*Tip: Tell students to underline key words on Reasoning pages and Evidence cards.*
2. Under step 4, tell students to attach the Evidence cards to their Reasoning pages using tape, staples, or glue as appropriate.
3. Once students have identified the plausible arguments, discuss them as a group.
4. Discuss:
  - a. Reasoning #2 is part of a Bad Argument. Using the same evidence card (#4), come up with

a more plausible line of reasoning that supports a reproductive advantage for low-plated sticklebacks in Loberg Lake.

- b.** Reasoning #3 does not relate to reproductive advantage in Loberg Lake, but it is relevant to sticklebacks in an ocean environment. Discuss how different traits can be an advantage depending on an individual's environment.
- 5.** Once the class agrees on which arguments are plausible and why, have everyone fill in the information for Reproductive Advantage on their Natural Selection Checklists.

## Paper-saving instructions

Follow the standard instructions, with the following changes:

- 1.** Make a classroom set of Reasoning pages and Evidence cards to re-use.
- 2.** Give each student a copy of the Plausible Arguments Organizer, where they can record their answers.

## Reference

The plausible arguments in this activity are based on Barrett, R.D.H., Rogers, S.M. & Schluter, D. (2008). Natural selection on a major armor gene in threespine stickleback. *Science* 322, 5899, 255-257. doi:10.1126/science.1159978



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