

## TEAM TOOL 3.1

## A Phylogenetic Investigation for Not-Biology Teachers

### PURPOSE

By discovering unique “literacies” of an unfamiliar discipline, teachers recognize and value the contributions they are uniquely positioned to make to students’ learning in their particular discipline. This sample is for not-biology teachers. Similar model lessons about unfamiliar content, with texts at a challenge level for teachers, can be designed in any content with a similar result. Teachers are always able to identify new vocabulary and concepts that they worked out through metacognitive conversation with partners and small groups, as well as new ideas and information they acquired in the process.

### SAMPLE PROCEDURE

- List for the whole group a set of guiding questions:
  - What are the physical characteristics of each bird?
  - Which birds might be most closely related?
  - What makes you think so?
  - What questions do you have?
- Distribute to partners photographs of a set of different finches and direct them to the guiding questions. While one partner makes observations, problem solves, and thinks aloud, the other partner listens and records what the first partner is saying.
- In groups of four, after pairs share their most interesting observations, reflections, questions, and conclusions, the group discusses their ideas about which finches might be most closely related.
- Together group members construct a claim and support it with evidence from the photographs.
- Finally, groups design a whiteboard explanation to share with other groups explaining their hypothesis about relationships between the finches, including a schematic representation of how the group thinks the finches are related, observations and evidence that support their claim, relevant background knowledge, connections and interpretations that could be researched and substantiated, questions, research limitations and unresolved issues, and a proposal for additional research.
- Participants follow this hypothesis construction by conducting similar collaborative inquiries as they read and discuss a set of challenging, original-source texts (Darwin’s field studies of the Galapagos finches), using Think Aloud and small group protocols identical to those engaged in with the finch photos.
- Groups return to their whiteboard explanations to revise their work based on new understandings from their reading.
- Reflecting on this process, participants identify any new ideas or learning they experienced from reading the varied texts (photographs and field notes), and how the process of learning was supported by pair and small group metacognitive conversations.