



Helping Students Study and Think in Their Discipline

Instructor: Joseph Heras

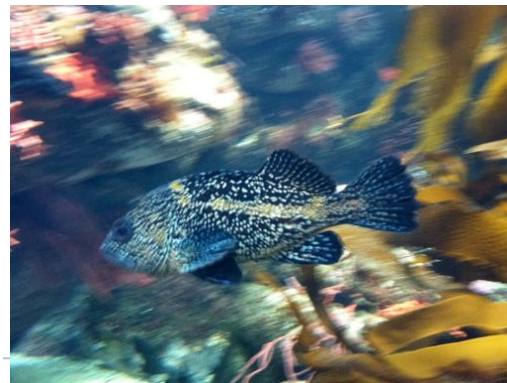
Joseph Heras

- ▶ 5th year QSB PhD candidate
- ▶ Rockfish Genomics



- ⦿ Teaching Fellow
- ⦿ 7 semesters of teaching experience
- ⦿ Introductory Biology Courses

- ✧ No prior teaching experience
- ✧ Trial and Error Methods



Workshop Outcomes

- ▶ Identify the different perceptions within the classroom
- ▶ Employ strategies that will allow a student's perspective and your perspective to overlap
- ▶ Design a discipline-specific problem that will allow students to think differently about the discipline



Does this happen to you?



Student's learning is not homogeneous...

- ▶ This was taken from the a study conducted at the University of Washington.
- ▶ “What students knew and how they grew seemed shaped by their academic majors to a great extent, which meant that their intellectual development was uneven and ‘domain-specific.’” (p. 11, Inside the Undergraduate Experience).



Who is considered an expert?

- ▶ Studies have revealed that “[experts’] knowledge is not simply a list of facts and formulas that are relevant to their domain; instead, their knowledge is organized around core concepts or ‘big ideas’ that guide their thinking about their domains” (*How People Learn*, p. 36). This begs the question, could introducing expert ways of organizing knowledge early in a learning process benefit novice scholars?



Inside the mind of an undergraduate...

Influences from parents

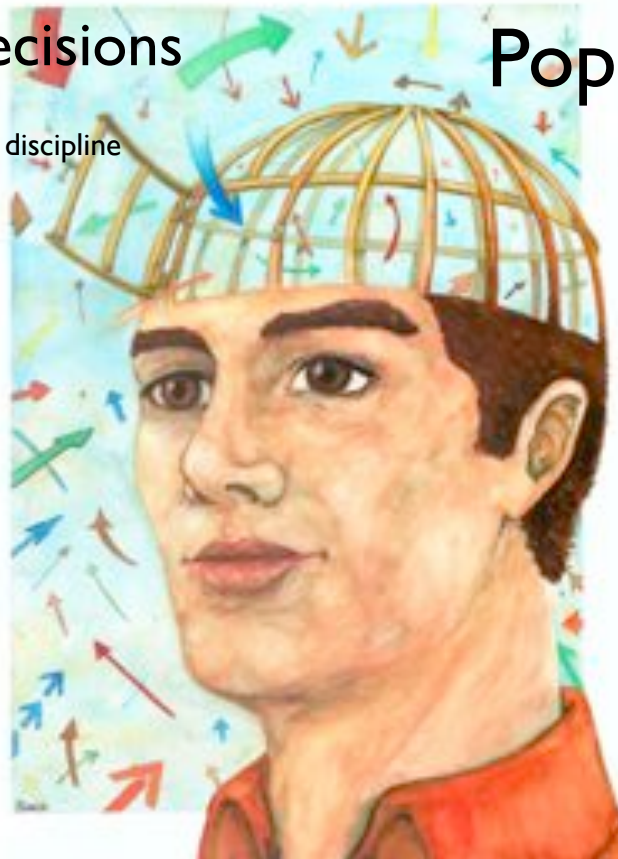
Social Life

Basic concepts

Career Decisions

Popular Culture

Perception of their respective discipline

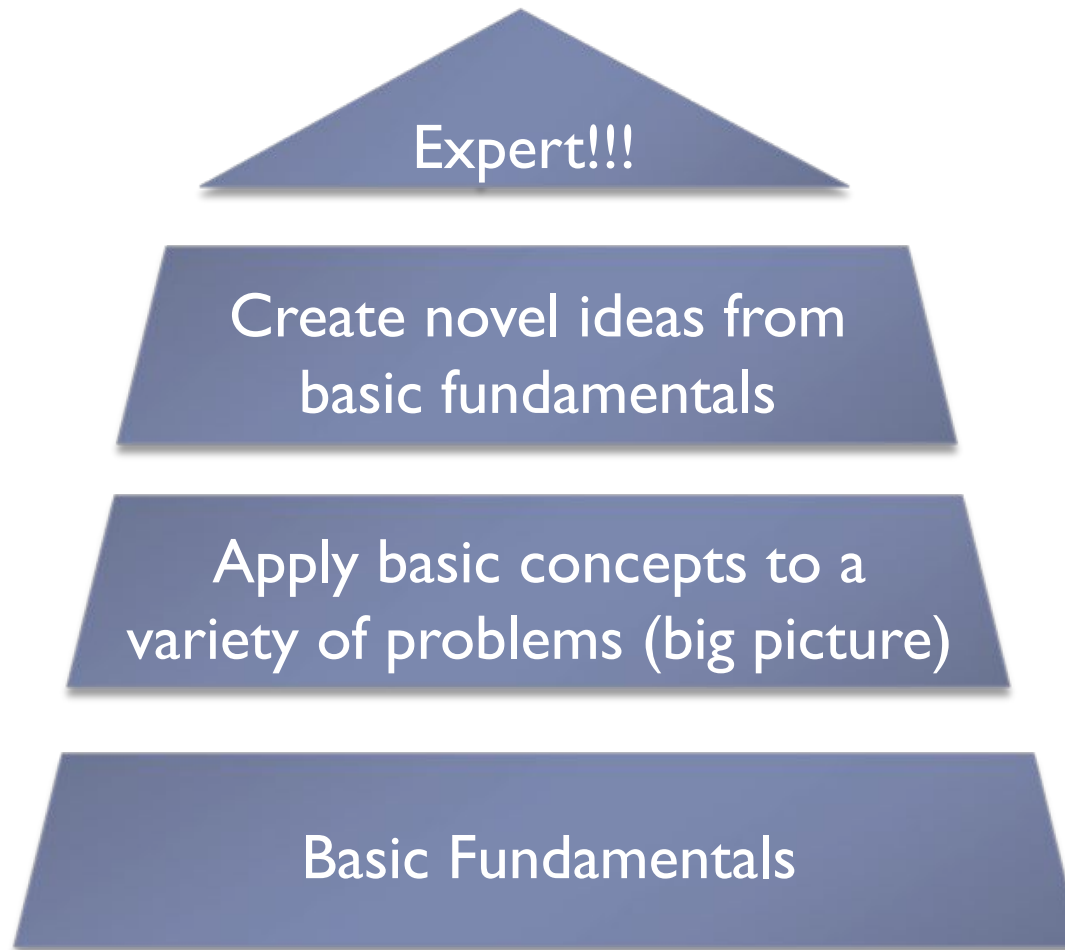


From a Natural Science Perspective

- ▶ Common fallacy from Biology Students
- ▶ “Biology is only memorizing a bunch of facts” – Undergraduate Student
- ▶ Regurgitation of facts onto an exam
- ▶ Critical thinking seems to be difficult

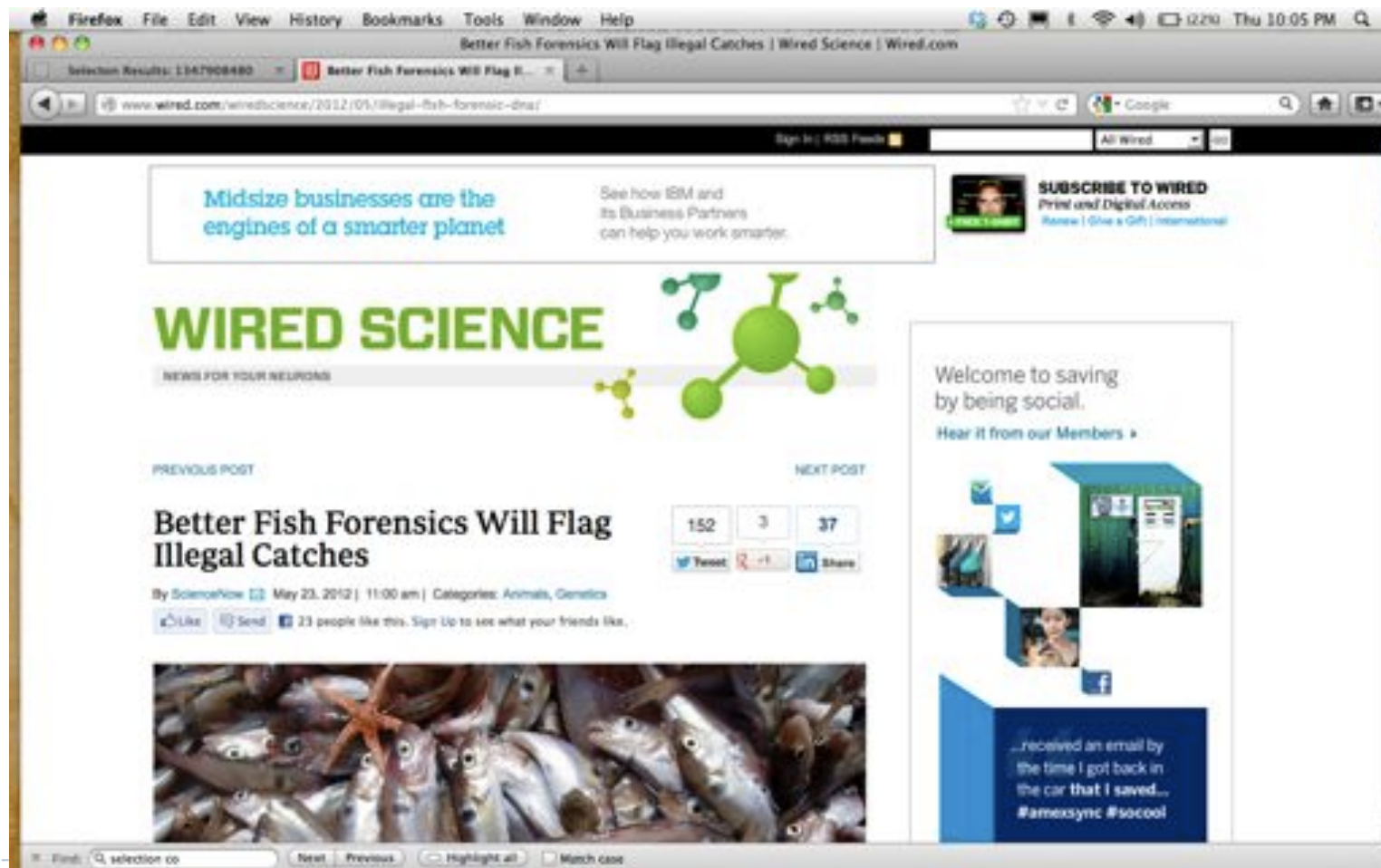


Hierarchy of achieving this status...



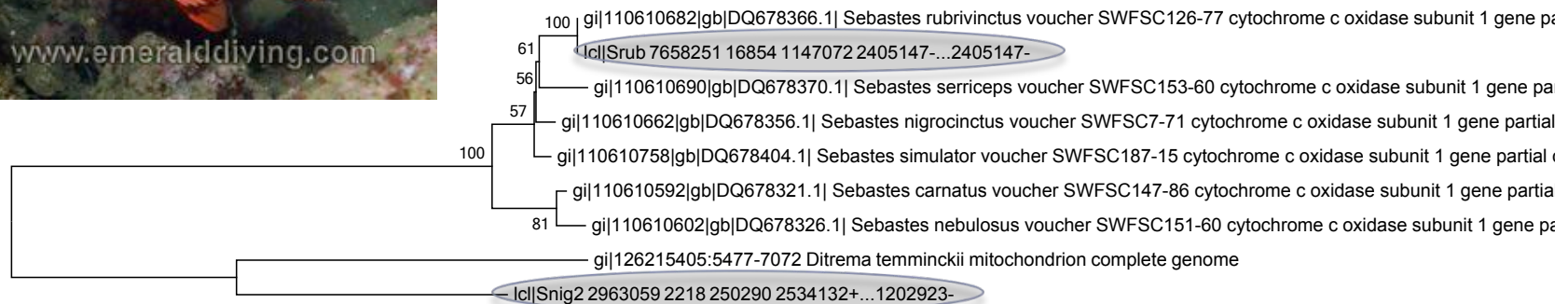
Example: Fish Forensics

Tip: Current events that allow students to understand a broader implication of the exercise



Example: Fish Forensics

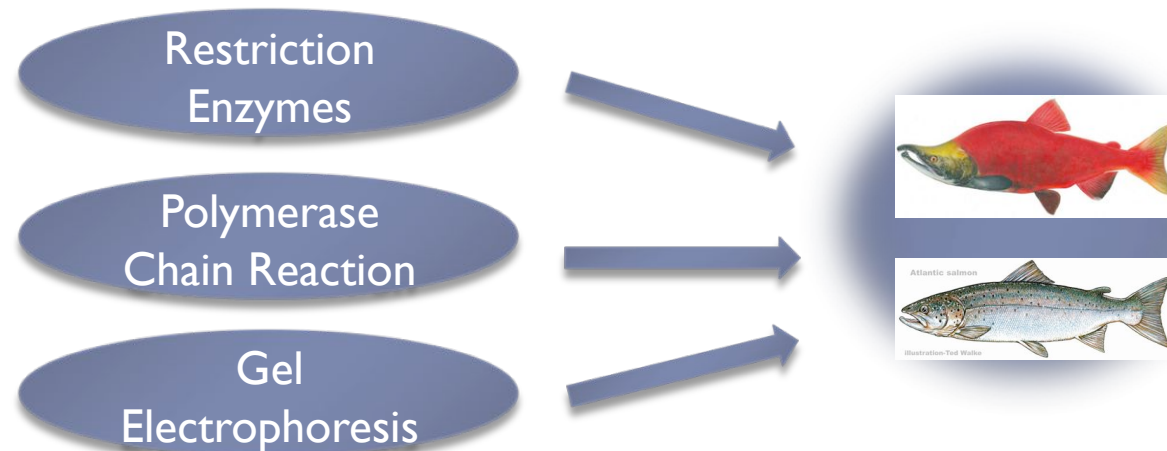
Tip: How these exercises apply to your respective discipline



Example: Fish Forensics

Tip: Using fundamental concepts to answer broader questions.

- ▶ Within this lab, we are trying to identify two different species of fishes. Please identify the principles of molecular biology that will allow us to answer these questions.



Group Activity (10 minutes)

- ▶ Address the disconnection within your respective field. Identify the pit-falls that students face within your discipline.
- ▶ What are common perceptions of students within your field.
- ▶ Develop a learning activity based on one of these three basic tips:
 - ▶ Popular culture
 - ▶ Problems that are currently reviewed by experts within your field
 - ▶ Use a problem with uses fundamental concepts to answer the question



Review

- ▶ Identify the different perceptions within the classroom (a student's outlook and your perspective)
- ▶ Employ strategies that will allow a student's perspective and your perspective overlap
- ▶ Design a discipline-specific problem that will allow students to think differently



The End

We understand
now!!!

