WHAT IS CREATE?

• CREATE is a pedagogy designed for students to analyze primary scientific literature in a structured way.
• CREATE, pioneered by Hoskins et al. (2007) and Hoskins (2008) in genetics and neurobiology classes, favors depth rather than breadth in curricular coverage.
• CREATE asks students to: Consider, Read, Elucidate the hypotheses, Analyze and interpret the data, and Think of the next experiment using a scaffolded approach (See Application section for more details).
• CREATE has been shown to help students read critically, analyze data, and improve understanding of science and research as processes rather than a disconnected body of facts (Hoskins et al. 2007).

CREATE IN UNDERGRADUATE ECOLOGY AT REGIS

• Ecology is an increasingly broad field which professors must help students navigate.
• At Regis, we chose to implement CREATE in our BL 402: Principles of Ecology course, favoring depth over breadth in ecology coverage to leverage its benefits.
• We choose 6 papers to cover over the course of the semester that focus on big ideas at various levels of the ecological hierarchy.
• Our implementation differs from Hoskins et al. (2007) in that we do not try to find connected papers. We do this to ensure enough breadth in basic ecology.
• In addition to the six papers, students are required to write a grant proposal detailing an ecological study they wish to perform.
• Course grades are computed as follows: 20% Daily Work & Participation, 25% Grant Proposal, 55% Exams

TYPICAL CREATE UNIT IN BL402: PRINCIPLES OF ECOLOGY (MWF, 50 minute class)

Day 1:
In class: Lecture over background ecology of paper.
At home: Read Introduction of paper and create a concept map of the major ideas highlighting hypotheses

Day 2:
In class: Guided activity over introduction, including key concepts and major hypotheses
At home: Read Methods of paper and create a methods cartoon depicting the study.

Day 3:
In class: Jigsaw over methods, including how measurements relate to questions. Stats lecture
At home: Read Results of paper and annotate figures/tables as they relate to hypotheses.

Day 4:
In class: Group presentations over figures/tables as they relate to authors' hypotheses
At home: Read Discussion of paper to summarize main findings and think of next study.

Day 5:
In class: Group presentations of next experiments and class vote on best! Revisit hypotheses, findings, and who cares.
At home: Study for exam!

Day 6:
In class: Exam consisting of explanation of concepts, explanation of figures/tables from required paper, and explanation of figures from other papers.

WHAT STUDENTS HAVE LEARNED

• Students remark that CREATE helps them improve their ability to read scientific articles, especially figure and table interpretation.
• These skills are transferrable across the curriculum.
• Students successfully apply the scientific process they are analyzing through CREATE to novel field investigations they design in their grant proposals.

WHAT WE HAVE LEARNED

• Some students initially have misgivings about the approach, but in the end are convinced that they can learn a lot by digging deeply into the literature...
• Students need to be coached about the nightly homework demands in comparison to a “traditional” lecture-only and exam course.
• We need to develop an instrument to formally and quantitatively assess the attainment of the course learning goals using a pre-post assessment.