

CREATES Method for Reading Scientific Papers

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Concept Map

Read

Elucidate hypotheses

Analyze & Interpret data

Think of the next Experiment

Synthesize

1. **Concept map** the paper introduction.
 - a. Define terms, identify what is already known.
 - b. Identify research problem or question
 - c. Identify variables and determine their relationships
2. **Read** Results and Methods sections.
 - a. Diagram/cartoon methods for each experiment
 - b. Annotate figures
 - i. Write own title/summary of the figure
 - c. Make connections between results and methods
3. **Elucidate** hypotheses
 - a. For each figure, define hypothesis being tested or question being addressed
 - i. Since... (Observation or Rationale)
 - ii. If... (Hypothesis or Question)
 - iii. Then... (Expected Outcome)

Activity #1: Concept Map the Introduction

Using the tips for concept mapping from our Week 1 Slides, concept map the Introduction to the Bowen, J.L., et al. (2017) paper “Lineage overwhelms environmental conditions in determining rhizosphere bacterial community structure in a cosmopolitan invasive plant.” Nature Communications 8, 433. Identify what is already known (background), the research problem or questions, goals of the study, etc. Use the following words as guides:

Bowen et al. 2017 Key Words

Plants	Invasive	<i>Phragmites australis</i>
Microorganisms	Native	Lineages
Soil	Genotype	Sympatric
Interactions	Biogeography	
Rhizosphere	Agriculture	
Microbiome	Pathogen	

Adapted from:

Hoskins, S.G., Lopatto, D., and Stevens, L.M. (2011). The C.R.E.A.T.E. Approach to Primary Literature Shifts Undergraduates' Self-Assessed Ability to Read and Analyze Journal Articles, Attitudes about Science, and Epistemological Beliefs. CBE Life Sci Educ 10, 368–378.

Activity #2 – Read Part I: Cartoon the Methods

Instructions: Work with your group on Part I of the “Read” step of the CREATE process. Use the space below to cartoon the methodologies for the field sampling, common garden experiment, and soil/plant tissue analysis. Methodology cartoons should be conceptual, rather than procedural. This means that you don’t need to include details about volumes and concentrations, but you should include any controls and comparisons.

Activity #4 – Elucidate the hypotheses

Instructions: First, identify the overarching hypothesis/question for the paper. Then, for the specific figure you were assigned, define hypothesis being tested or question being addressed.

Try to use the following prompts:

- Since... (Observation or Rationale)
- If... (Experimental Question)
- Then... (Expected Outcome/Results)