**Adaptation and Scoring of Washington State**

**Critical Thinking Rubric for Final Paper (42 points total)**

1. Identifies, summarizes (and appropriately reformulates) the problem, question, or issue. (6 pts)
   1. Is it a tractable problem that will yield interesting insights?
   2. Can the student frame a large problem and place data analysis in this context?
   3. Is there a logical progression to the development of the problem
2. Identifies and considers the influence of context and assumptions. (6 pts)
   1. Is it a tractable problem that will yield interesting insights?
   2. Understood that they had assumptions.
   3. Understood relationship between assumptions and conclusions.
   4. Placed problem in biological context.
   5. Tested assumptions.
3. Develops, presents, and communicates OWN perspective, hypothesis or position. (6 pts)
   1. Evidence of student’s own thinking.
   2. Good experimental design choices.
   3. Explained choices.
   4. Developed a hypothesis.
   5. Customized existing models.
   6. Understood relationship between data and literature.
   7. Facile with framing questions.
   8. Developed an integrated mental model.
4. Presents, assesses, and analyzes appropriate supporting data/evidence. (6 pts)
   1. Identified relationships between different aspects of data.
   2. Good experimental design and analysis.
   3. Used different strategies (integrates in silico and wet lab and whole plant).
   4. Analyzed their primer design
   5. Effective use of visualization.
   6. Used all available appropriate data.
5. Integrates issue using OTHER (disciplinary) perspectives and positions. (6 pts)
   1. Effective use of literature in introduction and discussion.
   2. Integrated information from other lab groups.
   3. Used a research strategy from the literature.
   4. Used other available data.
6. Identifies and assesses conclusions, implications, and consequences.
   1. Identified next steps. (6 pts)
   2. Qualified conclusions showing an understanding of limitations.
   3. Linked back to original question.
7. Communicates effectively. (6 pts)
   1. Compelling, appropriate, and interesting.
   2. Professional presentation.
   3. Transitions between sections, paragraphs, and ideas.
   4. Scientific argument vs. a narrative structure.
   5. Logical overall flow: starting from questions, developing case, answering question, implications.
   6. Citations and appropriate attributions.
   7. Includes visualizations.