**SEA PHAGES Reflective Writing Project**

**Instructor Guide**

**Quick Start:** Here are the essential steps in the reflective writing process:

1. Review with students the [Introduction to Reflective Writing](https://drive.google.com/file/d/1BQlUNFaMdIAsGHMDFbexp-m_cvN5x3xH/view?usp=sharing) (why it’s important, what it is) and the [Reflective Writing Rubric](https://drive.google.com/file/d/1GGqn2PWUIHK8pPbL6hqyhKbqIZiXAVqg/view?usp=sharing) (how they will be measured)
2. Administer the [Reflective Writing Prompts](https://docs.google.com/document/d/1_E9PWKA_OyDPESJnqRUiw6xHTiHeBukoPJDrn4E0WWI/edit?usp=sharing)
3. Give specific feedback using the Rubric and [Effective Feedback Guide](https://drive.google.com/file/d/1hCc8HoAg68Ffj2K4tQPQU11rf8wHWSPI/view?usp=sharing)
4. Repeat

**How Do I Make Time For This?**

This Introduction to Reflective Writing will take 15-30 minutes to review with students depending on how much time you engage students in the norming process at the end of the slide deck.

Reflective writing prompts can also vary in length of time:

* Give it as a graded homework assignment (how much time?)
* Set aside time during class (how much time?)

Feedback takes (how much time)

We encourage you to [make use of peer mentors and teaching assistants](https://docs.google.com/document/d/1EIk0q7gjb5KdhTW_JDhSoseD5Httn3H25mMAOsBHUPw/edit?usp=sharing) to free up time.

**The following guide explains how we use the reflective writing tool in various class size settings:**

**Large-Size Class With Multiple Laboratory Sections and Teaching Assistants** (50-550 students; Washington State University Model)

**Prior to The First Class:**

1. Review the [Introduction to Reflective Writing](https://drive.google.com/file/d/1BQlUNFaMdIAsGHMDFbexp-m_cvN5x3xH/view?usp=sharing), [Reflective Writing Rubric](https://drive.google.com/file/d/1BQlUNFaMdIAsGHMDFbexp-m_cvN5x3xH/view?usp=sharing), and [Effective Feedback Guide](https://drive.google.com/file/d/1hCc8HoAg68Ffj2K4tQPQU11rf8wHWSPI/view?usp=sharing).
2. (If needed) update the laboratory syllabus with a quick overview of reflective writing. Potential language is provided in this [sample syllabus document](https://docs.google.com/document/d/1DhuG9HI9tPjC7W3uMZ98KWr-_WyuS_Nc/edit).
3. Update the [Reflective Writing Feedback Planning Document](https://docs.google.com/spreadsheets/d/1pgJ-K7SpepYNapsXndBoaHEeUoMQSkK_/edit#gid=2093320977) to have the appropriate dates for the current semester or quarter.
4. Integrate the [Reflective Writing Project Prompts](https://docs.google.com/document/d/1_E9PWKA_OyDPESJnqRUiw6xHTiHeBukoPJDrn4E0WWI/edit?usp=sharing) into the student [Weekly Notebook Template document](https://docs.google.com/document/d/1obyW0tZcYPyDLxbPlYFuBljPaZrcsP9l/edit#heading=h.gjdgxs) that students will be required to fill out each week and upload into a “Journal” in the Blackboard Learn Learning Management System (alternative tools are available in other LMS that allow for weekly student document entries).
5. The week before labs begin, the instructor hosts a “Bootcamp” training session with the Undergraduate or Graduate Teaching Assistants who will evaluate the reflective writing. To begin the meeting, the instructor presents the [Introduction to Reflective Writing](https://drive.google.com/file/d/1BQlUNFaMdIAsGHMDFbexp-m_cvN5x3xH/view?usp=sharing) powerpoint and introduces the Teaching Assistants to the [Reflective Writing Rubric](https://drive.google.com/file/d/1GGqn2PWUIHK8pPbL6hqyhKbqIZiXAVqg/view?usp=sharing), and [Effective Feedback Guide](https://drive.google.com/file/d/1hCc8HoAg68Ffj2K4tQPQU11rf8wHWSPI/view?usp=sharing). A key element in the Introduction to Reflective Writing powerpoint are the last 3-4 slides that have authentic student reflections (anonymized) and are used to norm reflection scoring on the rubric before the start of the semester. The Teaching Assistants also review the [Weekly Notebook Template document](https://docs.google.com/document/d/1obyW0tZcYPyDLxbPlYFuBljPaZrcsP9l/edit#heading=h.gjdgxs) to understand the instructions provided to students about how reflective writing is integrated into the weekly notebook.
6. Since many Teaching Assistants teach multiple sections and work with 40 or more students per semester, it is unreasonable to expect them to provide reflection feedback on a weekly basis to every student in their lab sections. Therefore, teaching assistants are provided with the [Reflective Writing Feedback Planning Document](https://docs.google.com/spreadsheets/d/1pgJ-K7SpepYNapsXndBoaHEeUoMQSkK_/edit#gid=2093320977), an Excel file where they can design a schedule for providing four pieces of feedback to each student over the course of the semester/quarter. Briefly, students in each lab section are randomly assigned to four groups and each student is expected to receive feedback, using the [Reflective Writing Rubric](https://drive.google.com/file/d/1GGqn2PWUIHK8pPbL6hqyhKbqIZiXAVqg/view?usp=sharing), at four specific time points over the course of the semester.
7. ***Pro-Tips:***
	1. The reflective exercise must be part of the lab notebook requirements. In a large enrollment course with students with widely varying levels of engagement, motivation, and experience in science, students will not take the reflective writing assignment seriously or even remember to do it if it is not a part of a regular weekly routine.
	2. The reflective exercise must be assigned points for students to take it seriously. Even a small amount of points is adequate to get students to engage with building this skill. When SEA PHAGES instructors did not assign points, we observed that many students in our class provided reflections that remained at the same level of quality during the semester according to the rubric, and some even decreased sharply in quality over time. With points assigned the majority of students improved in one or more rubric categories over the course of the semester.
	3. The last 3-4 slides in the [Introduction to Reflective Writing](https://drive.google.com/file/d/1BQlUNFaMdIAsGHMDFbexp-m_cvN5x3xH/view?usp=sharing) Powerpoint can be updated with authentic student reflections from that instructor’s course after the first semester when reflective writing is introduced to a course to make the teaching assistant norming on the rubric more authentic.

**First Laboratory Meeting:**

1. Have the Undergraduate or Graduate Teaching Assistant provide a 10 minute presentation based on the first half to two thirds of the [Introduction to Reflective Writing](https://drive.google.com/file/d/1BQlUNFaMdIAsGHMDFbexp-m_cvN5x3xH/view?usp=sharing) Powerpoint to help frame for students why reflective writing is an important part of the SEA PHAGES experience and to remind them that there will be points assigned for their reflections.
2. The Teaching Assistant will introduce to students the [Weekly Notebook Template document](https://docs.google.com/document/d/1obyW0tZcYPyDLxbPlYFuBljPaZrcsP9l/edit#heading=h.gjdgxs) and emphasize how reflective writing is integrated into their weekly work reports.

**During the Semester:**

1. Using their completed [Reflective Writing Feedback Planning Document](https://docs.google.com/spreadsheets/d/1pgJ-K7SpepYNapsXndBoaHEeUoMQSkK_/edit#gid=2093320977) and the [Reflective Writing Rubric](https://drive.google.com/file/d/1GGqn2PWUIHK8pPbL6hqyhKbqIZiXAVqg/view?usp=sharing), Teaching Assistants provide feedback to their students at the first and third time points during the semester. The feedback is provided through the Blackboard LMS and associated with the appropriate weekly notebook entry. This feedback is designed to help students develop their skills in reflective practice. The scores assigned to each student on each reflective question is recorded in the tables found in that laboratory section’s [Reflective Writing Feedback Planning Document](https://docs.google.com/spreadsheets/d/1pgJ-K7SpepYNapsXndBoaHEeUoMQSkK_/edit#gid=2093320977).
2. At the second and fourth time points of review the Teaching Assistants follow the procedures outlined in During the Semester - Point 1 above. In addition, the student reflections are assigned points that are used when assigning final laboratory grades for the semester.
	1. We found that a total of 2 points per reflection review was adequate.
	2. The teaching assistants usually assigned 0.66 points each for categories 1, 2, and 3 on the rubric
	3. To receive full marks on a reflection response students had to score a “2” or “3” in that category on the rubric.
	4. A “1” in a rubric category would earn a student 0.33 points
	5. A “0” in a rubric category earned a student 0 points
3. During the semester the teaching assistants performed random notebook checks (usually around weeks 6 and 12 of the semester) to ensure that students were keeping their laboratory notebooks up to date. ~20% of those notebook check points were assigned to completion of the reflective writing prompts to further motivate student completion each week.

**Post-Semester:**

1. Teaching Assistants send an electronic copy of the completed [Reflective Writing Feedback Planning Document](https://docs.google.com/spreadsheets/d/1pgJ-K7SpepYNapsXndBoaHEeUoMQSkK_/edit#gid=2093320977) for each laboratory section to the course instructor
	1. This allows the instructor to do post-course analyses of student reflective scores and how they changed over the semester/quarter
	2. This allows the instructor to review the scoring of individual Teaching Assistants and modify the teaching assistant bootcamp materials in future semesters.

**Medium Size Class** (25-30 students- The University of Maine model)

**Prior to The First Class:**

1. Review the [Introduction to Reflective Writing](https://drive.google.com/file/d/1BQlUNFaMdIAsGHMDFbexp-m_cvN5x3xH/view?usp=sharing), [Reflective Writing Rubric](https://drive.google.com/file/d/1GGqn2PWUIHK8pPbL6hqyhKbqIZiXAVqg/view?usp=sharing), and [Effective Feedback Guide](https://drive.google.com/file/d/1hCc8HoAg68Ffj2K4tQPQU11rf8wHWSPI/view?usp=sharing).
2. Integrate the [Reflective Writing Prompts](https://docs.google.com/document/d/1_E9PWKA_OyDPESJnqRUiw6xHTiHeBukoPJDrn4E0WWI/edit?usp=sharing) into your learning management system or use the google form [SEA-PHAGES Reflective Exercise](https://docs.google.com/forms/d/1lbl_vF7BWzrKXnjQA3RMqs_5sgGiBUA2poTsQV_Jxls/edit?usp=sharing) to gather student reflections. The [SEA-PHAGES Reflective Exercise](https://docs.google.com/forms/d/1lbl_vF7BWzrKXnjQA3RMqs_5sgGiBUA2poTsQV_Jxls/edit?usp=sharing) is administered three times during the semester: on the first class day, mid-semester and on the last class day.
3. ***Optional:***
	1. The [SEA PHAGES Reflective Exercise](https://docs.google.com/forms/d/1lbl_vF7BWzrKXnjQA3RMqs_5sgGiBUA2poTsQV_Jxls/edit?usp=sharing) can be administered weekly.
	2. See below “Five Elements of Effective Thinking” Add On Prompts.
4. ***Pro-Tip:*** We recommend establishing the reflective exercise as part of lab notebook requirements or providing extra credit for completed reflections.

**First Class Day:**

1. Review with students the powerpoint “[Introduction to Reflective Writing](https://drive.google.com/file/d/1BQlUNFaMdIAsGHMDFbexp-m_cvN5x3xH/view?usp=sharing)” that explains what reflective writing is and why it’s important to learning.
2. Administer the [SEA PHAGES Reflective Exercise](https://docs.google.com/forms/d/1lbl_vF7BWzrKXnjQA3RMqs_5sgGiBUA2poTsQV_Jxls/edit?usp=sharing).
3. Week 1: Handout: [Jennifer-Moon-Resource-for-Writing-Reflections](https://drive.google.com/drive/folders/1Erb-w0C5aZXkK8MGdgNpdCkq15UYB910) by Jennifer Moon.

**Weekly:**

1. Provide feedback to student reflections using the suggested feedback in [Reflective Writing Rubric](https://drive.google.com/file/d/1GGqn2PWUIHK8pPbL6hqyhKbqIZiXAVqg/view?usp=sharing) and the [Effective Feedback Guide](https://drive.google.com/file/d/1hCc8HoAg68Ffj2K4tQPQU11rf8wHWSPI/view?usp=sharing).
2. Mention to class how much you appreciated reading the reflections. If there are questions that have emerged as part of the reflections, raise these. You want to demonstrate that you’re taking student reflections seriously.
3. 13 reflective writing assignments assigned weekly

**Optional: Five Elements of Effective Thinking Add On**

[The Five Elements of Effective Thinking](https://www.amazon.com/5-Elements-Effective-Thinking/dp/0691156662), by Edward Burger and Michael Starbird, provides thinking strategies to improve learning. The following prompts could be added:

First class day reflective exercise:

* *Choose a quote or text excerpt from your reading assignment “The Five Elements of Effective Thinking”(p. 13 – 46) that is most significant to you. Write freely about why this text is significant to you and how it applies to your own thinking/learning practices. Include the quote and the citation of your quote in your response.*

Mid-point reflective exercise:

* *Choose a quote or text excerpt from your reading assignment “The Five Elements of Effective Thinking”(p. 47 – 72) that is most significant to you. Write freely about why this text is significant to you and how it applies to your own thinking/learning practices. Include the quote and the citation of your quote in your response.*

Last class day reflective exercise:

* *Choose a quote or text excerpt from your reading assignment “The Five Elements of Effective Thinking”(p. 73 – 96) that is most significant to you. Write freely about why this text is significant to you and how it applies to your own thinking/learning practices. Include the quote and the citation of your quote in your response.*
* *Write freely about a journal entry that you made in Reflect 1 and Reflect 2 assignments. Include quotes from these journal entries and respond. Why did you choose these quotes? What has changed about your mindset or learning since then and how and why specifically did it change?*

**Small Size Class** (5-20 students) Cabrini University and Neumann University Model

 The Small class size model is given to both the Wet lab (Phage discovery) and the Bioinformatics course. This workflow is based on a single section.

**Prior to The First Class:**

1. Instructor - Review the [Introduction to Reflective Writing](https://drive.google.com/file/d/1BQlUNFaMdIAsGHMDFbexp-m_cvN5x3xH/view?usp=sharing), [Reflective Writing Rubric](https://drive.google.com/file/d/1GGqn2PWUIHK8pPbL6hqyhKbqIZiXAVqg/view?usp=sharing) and [Effective Feedback Guide](https://drive.google.com/file/d/1hCc8HoAg68Ffj2K4tQPQU11rf8wHWSPI/view?usp=sharing).
2. ***Both Wet lab portion and Bioinformatics sections of the SEA-PHAGES program.*** Integrate the [Reflective Writing Project Prompts](https://docs.google.com/document/d/1_E9PWKA_OyDPESJnqRUiw6xHTiHeBukoPJDrn4E0WWI/edit?usp=sharing) into your learning management system or use the Google form [SEA-PHAGES Reflective Exercise](https://docs.google.com/forms/d/1lbl_vF7BWzrKXnjQA3RMqs_5sgGiBUA2poTsQV_Jxls/edit?usp=sharing) to gather student reflections. The [SEA-PHAGES Reflective Exercise](https://docs.google.com/forms/d/1lbl_vF7BWzrKXnjQA3RMqs_5sgGiBUA2poTsQV_Jxls/edit?usp=sharing) is administered three times during the semester: on the first class day, mid-semester and on the last class day.
	1. Reflective writing links for students is posted on the learning management system.
	2. Each reflective assessment is worth 10 points. If any part of the assignment is missing or lack of answers points are deducted accordingly.
3. ***Wet lab portion only:*** These assignments are given in weeks when the reflective writing in part 2 and 4 are not administered.
	1. The [SEA PHAGES Reflective Exercise](https://docs.google.com/forms/d/1lbl_vF7BWzrKXnjQA3RMqs_5sgGiBUA2poTsQV_Jxls/edit?usp=sharing) can be administered weekly.
	2. See below “Five Elements of Effective Thinking” Add On Prompts.
	3. Students are given credit for full completion of the assignment. The assignments are worth 10 points and if any part of the assignment is missing or lack of answers points are deducted accordingly.
4. ***Wet lab portion only:*** Journal writing is included as part of the overall assessment of the course. These assignments are given in weeks when the reflective writing in part 2 and 3 are not administered.
	1. Journal writing is based on a 10 point scale.
5. If all reflective and journal writing is used in the course it covers a total of 10 weeks of a 15 week semester. This would allow for students to gain a better understanding of what it means to be immersed in a research setting and for self evaluation.

 **First Class Day for both Wet lab and Bioinformatics:**

1. Review with students the powerpoint rubric and expectations for these reflective writing that explains what reflective writing is and why it’s important to learning.
2. Administer the [SEA PHAGES Reflective Exercise](https://docs.google.com/forms/d/1lbl_vF7BWzrKXnjQA3RMqs_5sgGiBUA2poTsQV_Jxls/edit?usp=sharing) online that is due at the end of the first week of the class or after the second class period.

**Between weeks 1 and 5:**

1. Provide feedback to student reflections using the suggested feedback in the [Reflective Writing Rubric](https://drive.google.com/file/d/1GGqn2PWUIHK8pPbL6hqyhKbqIZiXAVqg/view?usp=sharing) and the [Effective Feedback Guide](https://drive.google.com/file/d/1hCc8HoAg68Ffj2K4tQPQU11rf8wHWSPI/view?usp=sharing).
	1. Feedback can be given electronically or in person.
2. Reminders sent to class about the reflective writing assignment. Mention to the class how much you appreciated reading the reflections. If there are questions that have emerged as part of the reflections, raise these. You want to demonstrate that you’re taking student reflections seriously.

**Between weeks 2 and 6:**

1. Students are given prompts mentioned in the section above for both journal writing and the “Five Elements of Effective Thinking” Add On Prompts. Student feedback is not always provided for journals.

**Mid-Semester:**

1. Administer the [SEA PHAGES Reflective Exercise](https://docs.google.com/forms/d/1lbl_vF7BWzrKXnjQA3RMqs_5sgGiBUA2poTsQV_Jxls/edit?usp=sharing) virtually.
2. Provide feedback to student reflections using the suggested feedback in the [Reflective Writing Rubric](https://drive.google.com/file/d/1GGqn2PWUIHK8pPbL6hqyhKbqIZiXAVqg/view?usp=sharing) and the [Effective Feedback Guide](https://drive.google.com/file/d/1hCc8HoAg68Ffj2K4tQPQU11rf8wHWSPI/view?usp=sharing).
	1. Feedback can be given electronically or in person.

**Between weeks 6 and 14:**

1. Students are given prompts mentioned in the section above for both journal writing and two assignments of the “Five Elements of Effective Thinking” Add On Prompts. Student feedback is not always provided for journals.

**Last Class Day:**

1. Administer the [SEA PHAGES Reflective Exercise](https://docs.google.com/forms/d/1lbl_vF7BWzrKXnjQA3RMqs_5sgGiBUA2poTsQV_Jxls/edit?usp=sharing) virtually.
2. Provide feedback to student reflections using the suggested feedback in the [Reflective Writing Rubric](https://drive.google.com/file/d/1GGqn2PWUIHK8pPbL6hqyhKbqIZiXAVqg/view?usp=sharing) and the [Effective Feedback Guide](https://drive.google.com/file/d/1hCc8HoAg68Ffj2K4tQPQU11rf8wHWSPI/view?usp=sharing).
3. Feedback was given electronically.

**Optional Assessment materials:**

**Journal writing, Wet lab only:**

1. Below is a list of questions the students are given. Only select questions from this are given for each of the 4 journal assignments. These are done virtually and submitted as word documents in the LMS.
	1. What research skills are you working on?
	2. What are you finding challenging for you?
	3. What are you discovering about yourself?
	4. What is helping or hindering you in achieving your objective/goals?
	5. What goal(s) have you set for yourself this week?
	6. What is one thing that would help you reach your goal?
	7. What is one question you have this week that you would like addressed and why?

**Five Elements of Effective Thinking Add On, Wet lab only**

[The Five Elements of Effective Thinking](https://www.amazon.com/5-Elements-Effective-Thinking/dp/0691156662), by Edward Burger and Michael Starbird, provides thinking strategies to improve learning. The following prompts could be added:

Reflective exercise given between weeks 2 and 6:

* *Choose a quote or text excerpt from your reading assignment “The Five Elements of Effective Thinking”(p. 13 – 46) that is most significant to you. Write freely about why this text is significant to you and how it applies to your own thinking/learning practices. Include the quote and the citation of your quote in your response.*

Reflective exercise given between weeks 6 and 8:

* *Choose a quote or text excerpt from your reading assignment “The Five Elements of Effective Thinking”(p. 47 – 72) that is most significant to you. Write freely about why this text is significant to you and how it applies to your own thinking/learning practices. Include the quote and the citation of your quote in your response.*

Reflective exercise given between weeks 8 and 14:

* *Choose a quote or text excerpt from your reading assignment “The Five Elements of Effective Thinking”(p. 73 – 96) that is most significant to you. Write freely about why this text is significant to you and how it applies to your own thinking/learning practices. Include the quote and the citation of your quote in your response.*