

2021 Report  
Of  
The Provost's Assessment Committee  
For  
General Education Learning Outcomes

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The Provost's Assessment Committee for General Education Learning Outcomes (PAC GELO) was formed in the fall of 2016 and was charged with developing assessment tools and a process to assess the extent to which UAS undergraduate students have acquired broadly expected academic skills through the completion of UAS prescribed General Education Requirements (GER) coursework. The committee includes faculty members from the three UAS campuses and from different disciplines within the schools of Education and Career Education, and the departments of Humanities, Social Sciences, Natural Sciences, and Business Administration. Work on identifying and creating General Education Learning Outcomes (GELO) began soon after representatives from the committee attended an Association of American Colleges & Universities (AAC&U) workshop in February 2017.

Since its inception, the PAC GELO has been successful in developing and assessing general education student learning outcomes using rubrics that we have collaboratively developed.

This report comprises four sections, each of which outlines phases through which the PAC GELO has passed in meeting its obligations to date.

## I. General Education Learning Outcomes & Rubric Development

With the UAS Student Competencies in mind (see <http://catalog.uas.alaska.edu/student-competencies/>) and recommendations in the highly regarded AAC&U Value Rubrics (Rhodes, 2010) found at <https://www.aacu.org/value-rubrics>, the following GELOs were developed and presented by the PAC GELO to the UAS Faculty Senate. The Senate approved continued work by the PAC GELO on these at their November 2017 meeting.

1. **Effective Communication:** *Communicate thoughts and ideas effectively, orally and in writing.*
2. **Critical Thinking:** *Demonstrate comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion.*
3. **Creative Thinking:** *Present creative works of expression, innovative approaches to tasks, or solutions to problems.*
4. **Empirical Reasoning:** *Articulate the scientific method and pose well-reasoned questions in the search for answers through data.*
5. **Synthesis and Analysis\*:** *Use and extend theoretical concepts to qualitative and quantitative applications and problem solving.*
6. **Environmental and Community Engagement:** *Use and extend Indigenous and global cultural perspectives with respect for diversity of people, the sustainable use of resources, and awareness of the environment.*

Rubrics for assessing the level to which UAS undergraduate students acquire these Values (and satisfy the corresponding GELOs) were adapted for UAS from the material provided in the AAC&U Value Rubrics resources.

After extensive discussions, the PAC GELO settled on a set of rubrics to guide assessment of UAS undergraduate general education learning that are general enough to apply to a wide range of artifacts. In addition, the rubrics were designed to provide insightful information about the level of student learning. The three levels chosen are classified as *Beginning*, *Proficient*, and *Mastery*.

Each rubric was carefully created to demonstrate that an undergraduate student has acquired some level of competency in each of the six learning outcomes. After creating and reviewing the rubrics for the first four competencies in 2018, the committee worked on the last two rubrics (Synthesis and Analysis, and Environmental and Community Engagement) in spring 2019. During several work sessions, it was determined that the *Synthesis and Analysis* GELO overlapped significantly with the *Empirical Reasoning* GELO and the *Critical Thinking* GELO, and it was therefore unnecessary. The committee requested that the Faculty Senate approve the removal of *Synthesis and Analysis* GELO from the original list of SLOs.

During the spring 2019 rubric development period, the last GELO (Environmental and Community Engagement) was closely reviewed, and the descriptor for the outcome was ultimately revised to more accurately reflect the desired student learning outcome. The committee worked with the Chancellor's Advisory Council on Native Education (CACANE) to revise the descriptor for the GELO which helped guide the completion of the rubric in Fall 2019.

GELOs with edits were approved by Faculty Senate in November 2019:

1. **Effective Communication:** *Communicate thoughts and ideas effectively, orally and in writing.*
2. **Critical Thinking:** *Demonstrate comprehensive exploration of issues, ideas and/or theories, artifacts, and events before accepting or formulating an opinion, conclusion, or solution.*
3. **Creative Thinking:** *Present creative works of expression, innovative approaches to tasks, or solutions to problems.*
4. **Empirical Reasoning:** *Articulate the scientific method and pose well-reasoned questions in the search for answers through data.*
5. **Environmental and Community Engagement:** *Explore Indigenous and global social perspectives with respect for diversity of people, different perspectives of resource sustainability, and human impact on the environment.*

In Fall 2019, the committee hosted workshops to review artifacts for Empirical Reasoning and Environmental and Community Engagement. These workshops took place on December 12th, 2019.

For norming the Empirical Reasoning competencies, Professor Hay-Jahans administered a QM BUGS test (developed by faculty from University of Nebraska, Lincoln, and Georgia Southern University) to a group of students and then worked to categorize the questions to help standardize and automate scores. During the December workshop, the group went over the classifications to verify appropriateness. Once this was done, cumulative scores were obtained. The group determined that this method could be used for critical thinking and empirical reasoning moving forward. The committee will continue to explore this idea with the goal of automating data collection for assessment of Critical Thinking and Empirical Reasoning.

While comparing the Environmental and Community Engagement competencies with the rubric, a big concern was the breadth of the rubric. Scorers marked N/A for many of the categories within the rubric, because of assignment description, not student oversight. Differentiating between N/A and not addressed was challenging. The group thought it might be helpful to create some sort of standardized assignment that meets the needs of the rubric. Global perspectives, as a category, was interpreted differently across

group members and will need to be modified for future workshops. The rubric doesn't seem to address community engagement. Moving forward, we'll need to revisit this and find the best solution.

In Spring 2020, the committee hosted workshops to review artifacts for Creative Thinking and Effective Communication. These workshops took place on April 28th, 2020.

For Creative Thinking, the group reviewed an assignment completed by students in a 200-level psychology course. The rubric was adequate to the task of assessing the artifact, but minor revisions are needed. It was determined that the artifacts being evaluated were hard to match to the *student approach to the task* metric.

For Effective Communication the group reviewed an assignment completed by students in a 100-level psychology course. Again the rubric worked well with a minor addition of vocabulary usage into the lower levels of the "Use of language" column in the rubric.

In Fall 2020, the committee hosted workshops to review artifacts for Creative Thinking and Critical Thinking. These workshops took place on December 10, 2020. During the two hour workshop, seven faculty reviewed artifacts using the critical thinking rubric and nine faculty reviewed artifacts using the creative thinking rubric.

In Spring 2021, the committee hosted workshops to review artifacts for Empirical Reasoning and Environment and Community Engagement. These workshops took place on April 29, 2021. There were six faculty that participated in the two hour workshop conducted via Zoom.

## II. Method of Assessment

Starting in spring 2018, the PAC GELO has hosted workshops to assess two GELOs per semester on a rotating basis, as follows:

- **Spring 2018:** Effective Communication and Critical Thinking
- **Fall 2018:** Empirical Reasoning and Creative Thinking
- **Spring 2019:** Effective Communication and Critical Thinking
- **Fall 2019:** Empirical Reasoning and Environmental and Community Engagement
- **Spring 2020:** Effective Communication and Creative Thinking
- **Fall 2020:** Creative Thinking and Critical Thinking
- **Spring 2021:** Empirical Reasoning and Environmental and Community Engagement

The Fall 2020 and Spring 2021 workshops were conducted online via Zoom video-conferencing due to Covid-19 safety precautions. Each workshop was scheduled to be two hours long, with participants assessing a single artifact with five to ten student work samples per artifact. The student work samples were assessed based on the GELO rubrics. Work samples used for the assessment were randomly selected by assigning each student work sample a sequential number, and then running a random number-generating application to determine which samples to assess.

## **Artifacts and Workshops For AY 2021**

### ***Fall 2020 - Critical Thinking***

In the *Critical Thinking* workshop, participants assessed a literary analysis essay from a 100-level writing course. The assignment required students to select a short story from a list of provided options, and to interpret the underlying significance of the story, looking for subtle messages and providing an analysis of a single lesson found within the story.

The typical student taking this course is enrolled in either an associate or bachelor's degree program, and is often in their freshman year. It is a general education course that is required of all students, so students in the course are enrolled in a wide variety of degree programs. To take this course, students must either have passed an introductory college writing course with a C or better, or they must have tested out of that course.

The assessment team consisted of three PAC GELO members (one of whom facilitated) and five faculty volunteers. Participants assessed a total of ten student work samples.

### ***Fall 2020 - Creative Thinking***

For the *Creative Thinking* workshop, a professor provided an assignment from a 200-level creative writing course. The assignment asked students to write either a fictional story or a poem. It was required to be a complete narrative in which something happens over a limited timespan.

This is also a general education course, but it is one of over 20 options listed under the Humanities category, which also includes courses from disciplines such as world and Indigenous languages, art, philosophy and journalism. To take this course, students must have passed a lower level writing course with a C or better. It is a required course in the Creative Writing Minor and the Creative Writing emphasis of the English, Bachelor of Arts degree.

This assessment team consisted of a PAC GELO facilitator, two other PAC GELO members, and seven faculty volunteers. Participants assessed ten student work samples.

### ***Spring 2021 - Environmental and Community Engagement***

For the *Environmental and Community Engagement* GELO, workshop participants assessed a paper in which students reflected on the relationship of the environment to health and described how different ways of understanding environment and health relate to Alaska Native perspectives. The PAC GELO received four student work samples.

This artifact came from a 400-level special topics course that was cross-listed under Anthropology and Alaska Native Studies. The course had no prerequisites.

The assessment team was led by a PAC GELO member and consisted of five PAC GELO members and two faculty volunteers.

### ***Spring 2021 - Empirical Reasoning***

To assess *Empirical Reasoning*, a PAC GELO member created and administered a standardized online assessment to three of his classes: a 200-level statistics class, a 100-level college algebra class, and a 200-level calculus class. The assessment instrument provided data and charts from the results of a local salmon derby over a period of 72 years. Students were asked to respond to a series of multiple choice questions that were designed to align with the categories of the GELO rubric. Other PAC GELO members assisted in the process of aligning each question with the appropriate categories and levels within the GELO rubric.

The initial plan was to have workshop participants review the assessment instrument, analyze the results, and verify the alignment of each question with the GELO rubric categories. However, a major region-wide internet outage prevented the online workshop from taking place. Given that PAC GELO members had already aligned the assessment instrument with the GELO rubric, they opted to accept and use the results from this year's "pilot" and then work to fine-tune it next year. Additionally, the team agreed that the instrument could potentially be used to assess two GELOs at once: *Empirical Reasoning* and *Critical Thinking*. This may also allow for the possibility of doing pre- and post-assessment of both learning outcomes.

### III. Results

This section begins with a summary of the results from each of the four values assessed, and then outlines thoughts shared by workshop participants on the artifacts themselves. Raw scores assigned by assessment teams were summarized to determine the consistency among evaluator scores and to assess student learning. The raw data are available upon request.

#### *Results for Critical Thinking*

Table 3.1 provides an overall summary of the scores obtained from the sample works for this value.

Average overall scores (for Outcomes 1, 2, 4 and 5) for the sample works ranged from 1.74 through 1.78 with standard deviations ranging from 0.55 through 0.64.

**Table 3.1:** Summary of scores obtained from the *Effective Communication* works includes sample mean scores ( $\bar{x}$ ), standard deviations ( $s$ ), and percentages of items with scores greater than or equal to each benchmark.

		<b>% of work products with a score <math>\geq</math></b>				
		$\bar{x}$	$s$	1	2	3
<b>Outcomes</b>	<b>1. Problem</b>	1.76	0.62	100.00	40.00	0.00
	<b>2. Perspective</b>	1.78	0.64	100.00	50.00	0.00
	<b>3. Assumptions</b>	N/A	N/A	N/A	N/A	N/A
	<b>4. Info. From Sources</b>	1.74	0.55	100.00	40.00	0.00
	<b>5. Conclusion</b>	1.75	0.56	100.00	30.00	0.00
<b>Overall summaries</b>		<b>1.76</b>	<b>0.59</b>	<b>100.00</b>	<b>30.00</b>	<b>0.00</b>

The last three columns of Table 3.1 (and later such tables) list the percentages of student scores greater than or equal to the rubric's three benchmarks: *Beginning* (1), *Proficient* (2), and *Mastery* (3). These percentages suggest that students have no difficulty in achieving the *Beginning* benchmark in Outcomes 1, 2, 3, and 4. Difficulties arose at the proficient and higher benchmarks. Note that none of the students met the *Mastery* benchmark for this learning outcome.

There were some difficulties in assessing *Critical Thinking*. It was agreed that the artifact used may not have been an entirely suitable assessment tool, and there were some questions concerning some items in the rubric. With respect to Assumptions, it was agreed that more clarity is needed for this outcome. In particular, it is unclear if this refers to the writer's assumptions or that the assumptions are presented and interpreted. For this reason, it was not possible to fairly assess this outcome using the artifacts in question.

Other questions addressed the descriptions used for the levels of student understanding and/or achievement in the works used. The Committee is considering the possibility of preparing a single online assessment instrument for assessing *Critical Thinking* along with *Empirical Reasoning*.

#### *Results for Creative Thinking*

Table 3.2 provides an overall summary of the scores obtained using the sample works for this outcome.

Average overall scores for all five outcomes ranged from 1.03 through 1.33 with standard deviations ranging from 0.48 through 0.61. Scores within each Outcome were consistently low, and none of the works achieved the proficiency or mastery benchmarks.

**Table 3.2:** Summary of scores obtained from the *Creative Thinking* works includes mean scores ( $\bar{x}$ ), standard deviations (s), and percentages of items with scores greater than or equal to each benchmark.

		<b>% of work products with a score <math>\geq</math></b>				
		$\bar{x}$	s	1	2	3
<b>Outcomes</b>	<b>1. Vision &amp; Framework</b>	1.12	0.61	66.67	0.00	0.00
	<b>2. Details</b>	1.32	0.55	83.33	0.00	0.00
	<b>3. Approach</b>	1.08	0.48	50.00	0.00	0.00
	<b>4. Use of Existing Models</b>	1.03	0.57	66.67	0.00	0.00
	<b>5. Outcome</b>	1.33	0.50	83.33	0.00	0.00
<b>Overall summaries</b>		<b>1.18</b>	<b>0.55</b>	<b>66.67</b>	<b>0.00</b>	<b>0.00</b>

### *Results for Empirical Reasoning*

Table 3.3 provides an overall summary of the scores obtained from only the Elementary Statistics class, and Table 3.4 provides an overall summary of the scores obtained from the College Algebra and Calculus I students responses.

For the Elementary Statistics sample, average overall scores (for Outcomes 1 through 5) ranged from 2.13 through 2.72 with standard deviations ranging from 0.37 through 0.41. Scores within each Outcome were fairly consistent with standard deviations of 0.41 or lower. The lowest mean score was for Outcome 5; however, 100% of the samples assessed received scores at or above the proficient level for all five outcomes for this group of students. Additionally, Outcome 1 received a reasonably high proportion of scores at the mastery level. Areas of potential work and/or further discussion may be those addressing Outcomes 2 through 5.

**Table 3.3:** Summary of scores obtained for *Empirical Reasoning* work submitted by 11 Elementary Statistics students; includes mean scores ( $\bar{x}$ ), standard deviations (s), and percentages of items with scores greater than or equal to each benchmark.

		<b>% of work products with a score <math>\geq</math></b>				
		$\bar{x}$	$s$	1	2	3
<b>Outcomes</b>	1. Description	2.72	0.40	100.00	100.00	54.55
	2. Factors Applicable	2.20	0.37	100.00	100.00	9.09
	3. Design of Study	2.39	0.38	100.00	100.00	9.09
	4. Data Collection Methods	2.31	0.38	100.00	100.00	0.00
	5. Results	2.13	0.41	100.00	100.00	9.09
<b>Overall summaries</b>		<b>2.35</b>	<b>0.28</b>	<b>100.00</b>	<b>100.00</b>	<b>0.00</b>

The sample including College Algebra and Calculus I students was obtained for purposes of comparison. As expected, this group of students differed from the previous group. Calculus students, on average, scored higher than the College Algebra students, and among these Calculus students the highest scores were earned by those who had taken an elementary statistics course.

**Table 3.4:** Summary of scores obtained for *Empirical Reasoning* sample works submitted by 4 College Algebra Students and 7 Calculus I students; includes mean scores ( $\bar{x}$ ), standard deviations ( $s$ ), and percentages of items with scores greater than or equal to each benchmark.

		<b>% of work products with a score <math>\geq</math></b>				
		$\bar{x}$	$s$	1	2	3
<b>Outcomes</b>	1. Description	2.17	0.56	100.00	90.91	18.18
	2. Factors Applicable	1.57	0.56	100.00	81.82	0.00
	3. Design of Study	1.93	0.54	100.00	72.73	0.00
	4. Data Collection Methods	1.87	0.58	100.00	81.82	0.00
	5. Results	1.73	0.58	100.00	63.64	0.00
<b>Overall summaries</b>		<b>1.85</b>	<b>0.54</b>	<b>100.00</b>	<b>72.73</b>	<b>0.00</b>

### ***Results for Environmental and Community Engagement***

Table 3.5 provides an overall summary of the scores obtained using four sample works for this outcome. Average overall scores for the four outcomes ranged from 1.48 through 1.96 with standard deviations ranging from 0.60 through 0.71. Scores within each Outcome were fairly consistent for the most part, with the exception being Outcome 3 which had the lowest mean and highest standard deviation.

**Table 3.5:** Summary of scores obtained from the Environmental and Community Engagement sample works includes mean scores ( $\bar{x}$ ), standard deviations ( $s$ ), and percentages of items with scores greater than or equal to each benchmark.

		<b>% of work products with a score <math>\geq</math></b>				
		$\bar{x}$	$s$	1	2	3
<b>Outcomes</b>	1. Influence	1.96	0.69	100.00	50.00	0.00
	2. LIK	1.93	0.60	100.00	75.00	0.00
	3. Perspectives	1.48	0.71	75.00	25.00	0.00
	4. Human Impact	1.95	0.69	100.00	75.00	0.00
	<b>Overall summaries</b>	<b>1.83</b>	<b>0.70</b>	<b>75.00</b>	<b>50.00</b>	<b>0.00</b>

### *III. Results for Overall Observations and Comments*

There was a good degree of consistency in the scores, allowing for variability; however, evaluators once again encountered *some* difficulties in applying the rubrics seamlessly to the artifacts used. The least difficulties occurred for the *Empirical Reasoning* instrument, and the most difficulties occurred for the *Environmental and Community Engagement* artifact.

## **IV. Lessons Learned and Next Steps**

The PAC GELO members have continued to assess GERS and modify GELO rubrics as needed. Our assessment workshops provide an opportunity to assess how well our students are meeting the general education learning outcomes and allow the PAC GELO team to refine our rubrics and tailor them more specifically to meet our needs. All GELOs have now been assessed at least once and we are entering into second assessments for many of the GELOs. For the GELOs that have been assessed twice, we are confident that the rubrics are clear and effective, yet we would like to continue examining the Environmental and Community Engagement rubric (see below).

This section includes a breakdown of observations by PAC GELO members and assessment workshop participants, as well as an outline of the committee's proposed next steps in completing the task of preparing and implementing an effective general education student learning assessment plan.

### ***Workshop Challenges***

As reported last year, during year three of the workshop implementation, the group feels comfortable with the process and structure. We are also very grateful for the faculty volunteers who participate in the workshops. We have several repeat volunteers that make the process run very smoothly. Nevertheless, as GELO assessment is an ongoing process, there are a few areas that we hope to improve moving forward.

Artifact-rubric fit has continued to be a minor area of concern. Although this did not cause any major issues, it is a part of the process that we are always interested in improving. Every year, there seems to be improvements made in our ability to select appropriate artifacts, but it's possible that there are other changes that could be made to the process that would eliminate this concern. For example, we have discussed the possibility of designing course assignments to match specific GELO rubrics. This would require buy-in from faculty and proper planning to incorporate the assignment into a course before the artifact is needed for the workshop.

Additionally, the timeline of the workshop was sometimes a challenge depending on the length of the artifacts to be assessed. Two hours was generally enough time to assess ten artifacts as long as the artifact was no more than a few pages. Length of the artifact is an additional factor to consider when selecting artifacts. The committee has also recently discussed the notion of having assessments completed in an asynchronous way to facilitate more instances of artifact assessment. Our group will explore that idea during the fall convening.

### ***Rubric Design***

Actual application of the rubrics during the workshops has provided crucial feedback resulting in more user-friendly versions of the rubrics. We have now piloted all five rubrics. Currently, *Environmental and Community Engagement*, the least-assessed rubric, is the only rubric that we plan to continue to actively revise. This year's workshop participants provided helpful feedback indicating that we need to clarify some of the rubric language. The workshop reviewers were pleasantly surprised to receive student artifacts that were well suited to the rubric, however additional revisions will continue in AY 2021-2022.

### *Next Steps*

In an effort to respond to some of our past challenges, we are exploring the idea of standardization through digitization and also some ideas around asynchronous assessments. These are ongoing discussions within the PAC GELO team. The current vision would include some sort of online standardized test that would assess the main points of the GELOs. Given the nature of the different GELOs, it seems likely that this method could only apply to the *Empirical Reasoning* and *Critical Thinking* GELOs. During Spring of 2021 a prototype of this digital standardization was implemented related to GELO #4, empirical reasoning. The PAC GELO committee learned that a digital standardization process is quite possible in the foreseeable future.

Our assessment cycle continues as we plan to assess GELOs #1 and #4 in the upcoming fall 2021 semester. From here on, we will continue to assess two GELOs each semester in order to rotate which two GELOs are assessed at one time in an effort to gain fresh perspective as we juxtapose two different GELOs each assessment period. The committee will therefore work according to the following tentative assessment schedule:

- Fall 2020: GELO #2 (*Critical Thinking*) & GELO #3 (*Creative Thinking*); completed.
- Spring 2021: GELO #4 (*Empirical Reasoning*) & GELO #5 (*Environmental and Community Engagement*); completed.
- Fall 2021: GELO #1 (*Effective Communication*) & GELO #4 (*Empirical Reasoning*)
- Spring 2022: GELO #5 (*Environmental and Community Engagement*) & GELO #3 (*Creative Thinking*)
- Fall 2022: TBA
- Spring 2023: TBA

The majority of our efforts until this point have revolved around maintaining an assessment cycle even though the majority of classes were delivered in an online and virtual format. During AY 2021-22 year the committee plans to take the next substantive step, which will help UAS scale up the assessment processes. The intent is to turn the results of assessment into useful information related to the instructional programs at UAS. The PAC GELO committee continues to ask the larger UAS learning community if undergraduate students are meeting the GELO outcomes? And, if not, what methods can be implemented to help UAS achieve its critical learning outcomes?

## RUBRICS

### 1. **EFFECTIVE COMMUNICATION:** Communicate thoughts and ideas effectively, orally and/or in writing.

	AUDIENCE, FOCUS, AND PURPOSE...	ARRANGEMENT OF MATERIAL...	CONTENT MATERIAL...	SUPPORTING MATERIAL...	USE OF LANGUAGE...
<b>NOT APPLICABLE</b>	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A
<b>NOT YET (0)</b>	<input type="checkbox"/> ...are not considered.	<input type="checkbox"/> ...is not organized.	<input type="checkbox"/> ...is not appropriate for the assigned task.	<input type="checkbox"/> ...is not present or is not appropriate.	<input type="checkbox"/> ...is not clear and/or lacks focus and/or contains significant errors.
<b>BEGINNING (1)</b>	<input type="checkbox"/> ...are considered.	<input type="checkbox"/> ...incorporates basic transitions through shifts in topic.	<input type="checkbox"/> ...is presented in a somewhat general manner that is relevant to the assigned task.	<input type="checkbox"/> ...is clearly referenced within the work.	<input type="checkbox"/> ...is clearly focused and contains only few errors.
<b>PROFICIENT (2)</b>	<input type="checkbox"/> ...are clearly aligned with the assigned task.	<input type="checkbox"/> ...follows consistent patterns throughout the entire work.	<input type="checkbox"/> ...is developed or presented in a specific and detailed manner.	<input type="checkbox"/> ...is relevant to the assigned task and is integrated effectively.	<input type="checkbox"/> ...is expressive of meaning through clarity and fluency.
<b>MASTERY (3)</b>	<input type="checkbox"/> ...are thoroughly addressed by the assigned task.	<input type="checkbox"/> ...skillfully maintains the work's cohesiveness.	<input type="checkbox"/> ...illustrates mastery of the topic, conveying the writer's understanding of the material.	<input type="checkbox"/> ...is used to thoroughly develop ideas appropriate for the discipline and genre of the assigned task.	<input type="checkbox"/> ...actively enhances the effectiveness of the work as a whole.

2. **CRITICAL THINKING:** Demonstrate comprehensive exploration of issues, ideas and/or theories, artifacts, and events before accepting or formulating an opinion, conclusion, or solution.

	<b>ISSUE OR PROBLEM TO BE CONSIDERED CRITICALLY...</b>	<b>PERSPECTIVE, THESIS, OR HYPOTHESIS...</b>	<b>ASSUMPTIONS...</b>	<b>INFORMATION TAKEN FROM SOURCES...</b>	<b>CONCLUSION OR RELATED OUTCOMES...</b>
<b>NOT APPLICABLE</b>	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A
<b>NOT YET (0)</b>	<input type="checkbox"/> ...is not stated.	<input type="checkbox"/> ...is not stated.	<input type="checkbox"/> ...are not acknowledged.	<input type="checkbox"/> ...is not present.	<input type="checkbox"/> ...is not present.
<b>BEGINNING (1)</b>	<input type="checkbox"/> ...is implied.	<input type="checkbox"/> ...is implied.	<input type="checkbox"/> ...are identified.	<input type="checkbox"/> ...is included.	<input type="checkbox"/> ...is tied to some of the information discussed.
<b>PROFICIENT (2)</b>	<input type="checkbox"/> ...is presented in a clear and logical manner.	<input type="checkbox"/> ...is explicitly stated.	<input type="checkbox"/> ... are discussed.	<input type="checkbox"/> ...is used to develop a coherent analysis or synthesis.	<input type="checkbox"/> ...clearly identifies some related outcomes (consequences or implications).
<b>MASTERY (3)</b>	<input type="checkbox"/> ...is framed in such a manner that delivers information necessary for clear and complete understanding.	<input type="checkbox"/> ...takes into account the complexities of the issue.	<input type="checkbox"/> ... are used to question the context and/or others' assumptions.	<input type="checkbox"/> ...is used to develop an effective and comprehensive analysis or synthesis.	<input type="checkbox"/> ...incorporates opposing viewpoints and/or limitations.

3. **CREATIVE THINKING:** Present creative works of expression, innovative approaches to tasks, or solutions to problems.

	STUDENT'S VISION AND FRAMEWORK OF EXPLORING IDEAS...	DETAILS IN STUDENT'S IDEAS, QUESTIONS, FORMATS, OR PRODUCTS...	STUDENT'S APPROACH TO THE TASK...	STUDENT'S USE OF EXISTING MODELS...	STUDENT'S OUTCOME (OBJECT, SOLUTION, OR IDEA)...
<b>NOT APPLICABLE</b>	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A
<b>NOT YET (0)</b>	<input type="checkbox"/> ...relates strictly to the assigned task.	<input type="checkbox"/> ...relate strictly to the assigned task.	<input type="checkbox"/> ...relates strictly to the assigned task.	<input type="checkbox"/> ...copies or restates what is already available.	<input type="checkbox"/> ...does not serve its intended purpose.
<b>BEGINNING (1)</b>	<input type="checkbox"/> ...considers alternative perspectives.	<input type="checkbox"/> ...show signs of original thought.	<input type="checkbox"/> ...considers alternative processes.	<input type="checkbox"/> ...shows signs of deviation from expectations and common assumptions.	<input type="checkbox"/> ...serves its intended purpose (for example, solving a problem or addressing an issue).
<b>PROFICIENT (2)</b>	<input type="checkbox"/> ...actively explores alternative perspectives.	<input type="checkbox"/> ...demonstrate uniqueness and novelty.	<input type="checkbox"/> ...experiments with alternative processes.	<input type="checkbox"/> ...actively explores ideas in alternative contexts.	<input type="checkbox"/> ...makes an original contribution in its intended purpose.
<b>MASTERY (3)</b>	<input type="checkbox"/> ...engages in untested and potentially risky approaches to the assigned task(s).	<input type="checkbox"/> ...challenge traditional limitations.	<input type="checkbox"/> ...applies alternative processes with consideration to consequences.	<input type="checkbox"/> ...synthesizes what is already available to apply ideas in a new context.	<input type="checkbox"/> ...provides a meaningful answer to the task in an original and surprising context.

4. **EMPIRICAL REASONING:** Apply the scientific method to well-reasoned questions in the search for answers through data.

	A DESCRIPTION OF THE PROBLEM...	FACTORS APPLICABLE TO THE PROBLEM...	DESIGN OF THE STUDY...	DATA COLLECTION METHOD...	RESULTS...
<b>NOT APPLICABLE</b>	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A
<b>NOT YET (0)</b>	<input type="checkbox"/> ...is not present.	<input type="checkbox"/> ...are not identified.	<input type="checkbox"/> ...is not present.	<input type="checkbox"/> ...is not identified.	<input type="checkbox"/> ...are not present.
<b>BEGINNING (1)</b>	<input type="checkbox"/> ...is outlined.	<input type="checkbox"/> ...are identified.	<input type="checkbox"/> ...is described in terms of its purpose and objective.	<input type="checkbox"/> ...is identified.	<input type="checkbox"/> ...are summarized as appropriate to the discipline.
<b>PROFICIENT (2)</b>	<input type="checkbox"/> ...is clear and complete.	<input type="checkbox"/> ...are classified clearly.	<input type="checkbox"/> ...identifies appropriate methodology.	<input type="checkbox"/> ...is implemented correctly.	<input type="checkbox"/> ...are interpreted as appropriate to the discipline.
<b>MASTERY (3)</b>	<input type="checkbox"/> ...is formulated to include a proper and precise research question.	<input type="checkbox"/> ...are formulated into an appropriate testable hypothesis.	<input type="checkbox"/> ...identifies limitations of the proposed study.	<input type="checkbox"/> ...is used to produce (or leads toward) consistent and accurate data.	<input type="checkbox"/> ...are used to provide clear and concise scientific explanations of analysis.

5. **ENVIRONMENTAL AND COMMUNITY ENGAGEMENT:** Explore Indigenous and global social perspectives with respect for diversity of people, different perspectives of resource sustainability, and human impact on the environment.

	<b>INFLUENCE OF CULTURAL NORMS...</b>	<b>LOCAL INDIGENOUS KNOWLEDGE (LIK) AND PERSPECTIVES...</b>	<b>GLOBAL PERSPECTIVES...</b>	<b>HUMAN IMPACT ON AN ENVIRONMENT...</b>
<b>NOT APPLICABLE</b>	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A
<b>NOT YET (0)</b>	<input type="checkbox"/> ...is not identified.	<input type="checkbox"/> ...are not acknowledged.	<input type="checkbox"/> ...are not addressed.	<input type="checkbox"/> ...is not addressed.
<b>BEGINNING (1)</b>	<input type="checkbox"/> ...is identified.	<input type="checkbox"/> ...are acknowledged.	<input type="checkbox"/> ...are addressed.	<input type="checkbox"/> ...is addressed.
<b>PROFICIENT (2)</b>	<input type="checkbox"/> ...is explained.	<input type="checkbox"/> ...are developed or presented in an effective manner.	<input type="checkbox"/> ...are developed or presented in an effective manner.	<input type="checkbox"/> ...is described along with its consequences.
<b>MASTERY (3)</b>	<input type="checkbox"/> ...is analyzed and/or interrogated.	<input type="checkbox"/> ...are analyzed to thoroughly develop ideas.	<input type="checkbox"/> ...are analyzed to thoroughly develop ideas.	<input type="checkbox"/> ...is analyzed in a way that expresses the need for respectful engagement.