

2020 Report
Of
The Provost's Assessment Committee
For
General Education Learning Outcomes

Committee Members

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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 adapting rubrics for use on assessing 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 SLO *Synthesis and Analysis* GELO overlapped significantly with *Empirical Reasoning* GELO and *Critical Thinking* GELO, and 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 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.*

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 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.

II. Method of Assessment

Over the past three years, 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*

Learning Artifacts

Fall 2019 Assessment - Environmental and Community Engagement and Empirical Reasoning

In previous workshops, the PAC GELO assessed two artifacts per GELO, with 10 randomly selected student work samples per artifact. Several assessment teams found it difficult to complete assessment of all 20 student work samples in the allotted three hour timeframe. Feedback from participants also pointed to the fact that three hours was a rather long period of time. With this in mind, the PAC GELO opted to reduce workshops to two hours and to assess a single artifact per workshop, with ten student work samples per artifact. As with previous workshops, random selection was done by assigning each potential student work sample a sequential number. The only exception to this was the *Empirical Reasoning* artifact, as described below.

For the fall 2019 workshop, a professor provided an assignment from a 200-level anthropology class for the *Environmental and Community Engagement* GELO workshop. The assignment asked students to interview an Alaska Native leader to gain an Alaska Native perspective on an issue or experience. The GELO rubric was applied to ten randomly selected samples of student work.

The PAC GELO piloted a new approach for the *Empirical Reasoning* GELO. For this GELO, one PAC GELO member adapted and administered a standardized assessment tool in a 200-level statistics class. After administering the test, he categorized the questions to help standardize and automate the scoring. All student scores were included in the sample. During the workshop, the team went through the classifications to verify their alignment with the rubric, rather than directly assessing student work samples. After the workshop, the PAC GELO determined that they should explore the idea of incorporating the *Critical Thinking* GELO into this assessment tool in order to automate assessment of both GELOs. This may also allow for the possibility of doing pre- and post-assessment of both learning outcomes.

Spring 2020 Assessment - Creative Thinking and Effective Communication

In the spring workshops, the PAC GELO again followed the two-hour format, with one artifact per GELO and ten randomly selected student work samples.

The artifact for *Effective Communication* was selected from PSY S111 Introduction to Psychology. It was a portion of the final paper in which students were assigned to research three topics of interest and to find peer-reviewed articles on those topics. Students then summarized each article and discussed what interested them about the articles (10 student work samples). Participants noted that it would be helpful to incorporate mention of vocabulary usage into the lower levels of the “Use of language” column in the rubric.

The artifact for *Creative Thinking* came from a midterm project in a 200-level psychology course. Students were asked to select a topic that had been covered so far in the course and to find a creative way to explain the concept. Students were encouraged to use creative methods, such as video, comics, demonstrations, and a variety of technologies to explain the concept (10 student work samples).

About the Students Being Assessed

The typical student taking any one of these courses is enrolled in either an associate or bachelor's degree program. Specifically:

- The 200-level anthropology course is an option listed for students in the Alaska Native Studies Minor, the Bachelor of Arts in Elementary Education, and the Bachelor of Arts in Special Education.
- The 200-level statistics course serves as a general education option and requires that students have either passed *MATH 105 Intermediate Algebra* with a B or better, or that they've placed into the class by taking a placement exam.
- PSY S111 Introduction to Psychology is a general education option within the Social Sciences category. To enroll in this course, students must have either passed a 100-level writing course, or have instructor permission.
- The 200-level psychology course is a general education course within the Social Sciences category. In 2019-20, the prerequisite was *PSY S111 Introduction to Psychology*. This will change to a 100-level writing course in next year's catalog, removing *PSY S111* as a prerequisite.

Assessment Teams and Workshops

The PAC GELO co-chairs created the assessment teams with a goal of having at least two PAC GELO members on each team, along with an even split of the faculty volunteers. The main consideration in dividing up the teams had to do with spreading the committee members around as evenly as possible, since they were more familiar with the rubrics, artifacts, and processes.

In most cases, faculty volunteers were randomly assigned to teams, although in cases where a faculty member had expertise that related to a particular GELO, that person was assigned to the relevant team. For example, a communications faculty member volunteered for the spring workshop and was assigned to the team that assessed *Effective Communication*.

The fall 2019 *Environmental and Community Engagement* workshop took place in two separate locations - one on the Sitka campus and one on the Juneau campus. Each location had its own facilitator (both PAC GELO members), and the facilitators shared their data and notes after the workshops. The Sitka location had four faculty volunteers, and the Juneau location had three.

The fall 2019 *Empirical Reasoning* workshop took place solely on the Juneau campus, and the team included two PAC GELO members (one of whom facilitated) and five faculty volunteers.

Both spring workshops were conducted via video conferencing due to the coronavirus pandemic. The facilitators used Zoom video conferencing software and shared documents with participants via Google Drive. Most participants collaboratively updated the score sheets live via Google Sheets, although a few preferred to print their score sheets and send them to the facilitators after the workshop. At the beginning of the workshops, facilitators oriented participants to the rubric, the score sheets, and the artifacts. Each team read through and scored the first student work sample and then walked through the rubric together, comparing scores, discussing questions, and otherwise norming the rubrics. After that point, the teams read and scored two to three student work samples before coming back together as a group to discuss their scores.

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 Effective Communication

Table 3.1 provides an overall summary of the scores obtained from the artifact used to assess student learning in the area of Effective Communication. Sample mean scores ranged from 1.18 through 1.77, and standard deviations of the scores ranged from 0.50 through 0.70.

Table 3.1: Summary of scores obtained from the Effective Communication artifact includes sample mean scores (\bar{x}), standard deviations (s), and percentages of items with scores higher than each benchmark.

		% of work products with a score \geq				
		\bar{x}	s	1	2	3
Outcomes	1. Audience, Focus, and Purpose	1.62	0.64	100.0	53.3	8.3
	2. Arrangement of Material	1.77	0.59	100.0	68.3	8.3
	3. Content Material	1.47	0.50	100.0	46.7	0.0
	4. Supporting Material	1.18	0.70	83.3	35.0	0.0
	5. Use of Language	1.28	0.52	96.7	31.7	0.0
Overall summaries		1.46	0.63	96.0	47.0	3.3

The last three columns of Table 3.1 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 the least difficulty in achieving the *Beginning* and *Proficient* benchmarks in Outcomes 1 through 3, and the most difficulty in Outcome 4 (Supporting Material). Note that none of the students met the *Mastery* benchmark in Outcomes 3 through 5.

Results for Creative Thinking

Table 3.2 provides an overall summary of the scores obtained from the artifact used to assess student learning in the area of Creative Thinking. Sample mean scores for this learning outcome were quite low, ranging from 0.60 through 1.13, with standard deviations ranging from 0.43 through 0.79.

Table 3.2: Summary of scores obtained from the Creative Thinking artifact includes sample mean scores (\bar{x}), standard deviations (s), and percentages of items with scores higher than each benchmark.

		% of work products with a score \geq				
		\bar{x}	s	1	2	3
Outcomes	1. Vision and Framework	0.60	0.62	53.3	6.7	0.0
	2. Details in Ideas	0.83	0.72	65.0	18.3	0.0
	3. Approach to Task	0.67	0.71	53.3	13.3	0.0
	4. Use of Existing Models	0.87	0.79	61.7	25.0	0.0
	5. Outcomes	1.13	0.43	96.7	16.7	0.0
Overall summaries		0.82	0.68	66.0	16.0	0.0

The last three columns of Table 3.2 list the percentages of student work samples that scored greater than or equal to the rubric's three benchmarks: *Beginning* (1), *Proficient* (2), and *Mastery* (3). These percentages suggest that students have difficulty in achieving even the *Beginning* benchmark in Outcomes 1 through 4. This is most noticeable for Outcomes 1 and 3. However, 96.7% of the students met the *Beginning* benchmark for Outcomes 5. Again, this may be considered understandable for an introductory/lower division class.

Results for Empirical Reasoning

Table 3.3 provides an overall summary of the scores obtained from the artifact used to assess student learning in the area of Empirical Reasoning. Sample mean scores ranged from 1.50 through 2.05, and the standard deviations of the scores ranged from 0.42 through 0.52.

Table 3.3: Summary of scores obtained from the Empirical Reasoning artifact includes sample mean scores (\bar{x}), standard deviations (s), and percentages of items with scores higher than each proficiency benchmark.

		% of work products with a score \geq				
		\bar{x}	s	1	2	3
Outcomes	1. Description	2.05	0.52	100	53.3	0.0
	2. Factors	1.70	0.44	100	20.0	0.0
	3. Design	1.68	0.43	93.3	33.3	0.0
	4. Data Collection	1.57	0.44	93.3	20.0	0.0
	5. Results	1.50	0.42	100.0	20.0	0.0
Overall summaries		1.70	0.33	100.0	20.0	0.0

The last three columns of Table 3.3 list the percentages of work products that scored greater than or equal to the rubric's three benchmarks: *Beginning* (1), *Proficient* (2), and *Mastery* (3). In this case the data suggest that students have the greatest difficulty meeting the *Proficient* benchmark in Outcomes 2, 4, and 5, and the least difficulty in Outcome 1. Furthermore, none of the students met the *Mastery* benchmark for all five outcomes.

Results for Environmental and Community Engagement

Table 3.4 provides an overall summary of the scores obtained from the artifact used to assess student learning in the area of Environmental and Community Engagement. Sample mean scores ranged from 0.64 through 1.44, and the standard deviations of the scores ranged from 0.64 through 0.77.

Table 3.4: Summary of scores obtained from the Empirical Reasoning artifact includes sample mean scores (\bar{x}), standard deviations (s), and percentages of items with scores higher than each proficiency benchmark.

		% of work products with a score \geq				
		\bar{x}	s	1	2	3
Outcomes	1. Influence of Cultural Norms	1.44	0.82	91.7	43.8	31.3
	2. Indigenous Knowledge & Perspectives	1.42	0.66	91.7	50.0	39.6
	3. Global Perspectives	1.05	0.77	72.9	29.2	22.9
	4. Human Impact on Environment	0.64	0.64	47.9	14.6	4.2
Overall summaries		1.15	0.79	78.1	35.3	25.1

The last three columns of Table 3.3 list the percentages of work products that scored greater than or equal to the rubric's three benchmarks: *Beginning* (1), *Proficient* (2), and *Mastery* (3). Here the data suggest that students have the greatest difficulty meeting the *Beginning* benchmark in Outcome 4, and the least difficulty in Outcomes 1 and 2. A reasonable percentage of the students achieved *Mastery* in Outcomes 1, 2, and 3.

Results for Overall Observations and Comments

There was a good degree of consistency in the scores, allowing for variability; however, evaluators once again encountered 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.

As in the previous report, achieving *Mastery* posed some problems in the first three learning outcomes assessed. This, however, may be expected with students in the beginning of their academic programs.

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. For the GELOs that have been assessed twice, we are confident that the rubrics are clear and effective.

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

Three years into assessment workshops, the group is 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. As GELO assessment is an ongoing process, there were 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.

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. *Environmental and Community Engagement* is the only rubric that we plan to revise. Workshop participants provided helpful feedback indicating that we need to clarify some of the rubric language. Revising this rubric is a priority for AY 2020-2021.

Next Steps

In an effort to respond to some of our past challenges, we are exploring the idea of standardization through digitization. This is an ongoing discussion 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.

Our assessment cycle continues as we plan to assess GELOs #4 and #5 in the fall 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 #4 (*Empirical Reasoning*) & GELO #5 (*Environmental and Community Engagement*)
- Spring 2021: GELO #3 (*Creative Thinking*) & GELO #2 (*Critical Thinking*)
- Fall 2021: GELO #1 (*Effective Communication*) & GELO #4 (*Empirical Reasoning*)
- Spring 2022: GELO #5 (*Environmental and Community Engagement*) & GELO #3 (*Creative Thinking*)

The majority of our efforts until this point have revolved around creating and implementing a process for assessment. During AY 2020-21 we plan to take the next substantive step, which will help UAS close the assessment loop. The PAC GELO work group is now asking 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...
NOT APPLICABLE	<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
NOT YET (0)	<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.
BEGINNING (1)	<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.
PROFICIENT (2)	<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.
MASTERY (3)	<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.

	ISSUE OR PROBLEM TO BE CONSIDERED CRITICALLY...	PERSPECTIVE, THESIS, OR HYPOTHESIS...	ASSUMPTIONS...	INFORMATION TAKEN FROM SOURCES...	CONCLUSION OR RELATED OUTCOMES...
NOT APPLICABLE	<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
NOT YET (0)	<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.
BEGINNING (1)	<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.
PROFICIENT (2)	<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).
MASTERY (3)	<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)...
NOT APPLICABLE	<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
NOT YET (0)	<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.
BEGINNING (1)	<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).
PROFICIENT (2)	<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.
MASTERY (3)	<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...
NOT APPLICABLE	<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
NOT YET (0)	<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.
BEGINNING (1)	<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.
PROFICIENT (2)	<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.
MASTERY (3)	<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.

	INFLUENCE OF CULTURAL NORMS...	LOCAL INDIGENOUS KNOWLEDGE (LIK) AND PERSPECTIVES...	GLOBAL PERSPECTIVES...	HUMAN IMPACT ON AN ENVIRONMENT...
NOT APPLICABLE	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A
NOT YET (0)	<input type="checkbox"/> ...is not identified.	<input type="checkbox"/> ...are not acknowledged.	<input type="checkbox"/> ...are not addressed.	<input type="checkbox"/> ...is not addressed.
BEGINNING (1)	<input type="checkbox"/> ...is identified.	<input type="checkbox"/> ...are acknowledged.	<input type="checkbox"/> ...are addressed.	<input type="checkbox"/> ...is addressed.
PROFICIENT (2)	<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.
MASTERY (3)	<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.