



PROBLEM SOLVING RUBRIC

This rubric was adapted by an interdisciplinary team representing Columbia Gorge Community College through a process that examined and modified the AACU Problem Solving Value Rubric to meet the needs of CGCC's Institutional Learning Outcomes assessment. The rubric articulates fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubric is intended for institutional-level use in evaluating and discussing student learning, not for grading. The CGCC team agrees with the utility of the AACU Value rubric, which "is to position learning at undergraduate levels within a basic framework of expectations such that evidence of learning can be shared nationally through a common dialog and understanding of student success."

Institutional Learning Outcome #2

Through their respective disciplines, CGCC students who earn a degree can: Creatively solve problems by using relevant methods of research, personal reflection, reasoning, and evaluation of information. (Critical thinking and Problem-Solving)

Definition

Problem solving is the process of defining, evaluating, implementing a strategy to answer an open-ended question or achieve a desired goal.

Framing Language

Problem-solving covers a wide range of activities that may vary significantly across disciplines. Activities that encompass problem-solving by students may involve problems that range from well-defined to vague in a laboratory or real-world settings. This rubric represents the common elements of most problem-solving contexts and is designed to function across all disciplines. It is broad-based to allow for individual differences among learners, yet is concise and descriptive in its scope to determine how well students have maximized their respective abilities to practice thinking through problems in order to reach solutions.

This rubric is designed to measure the quality of a **process**, rather than the quality of an **end-product**. As a result, work samples will need to include evidence of the individual's thinking about a problem-solving task (e.g., reflections on the process from problem to proposed solution; steps in a problem-based learning assignment; record of the think-aloud protocol while solving a problem, etc.). The final product of an assignment that required problem resolution is insufficient without insight into the student's problem-solving process. Because the focus is on institutional-level assessment, scoring team projects, such as those developed in capstone courses, may also be appropriate.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- **Contextual Factors:** Constraints (such as limits on cost), resources, attitudes (such as biases) and desired additional knowledge which affect how the problem can be best solved in the real world or simulated setting.
- **Critique:** Involves analysis (a detailed examination of anything complex in order to understand its nature or determine its essential feature) and synthesis (the combining of often diverse perspectives into a clear concept or idea) of a full range of perspectives.
- **Feasible:** Workable, in consideration of time-frame, functionality, available resources, necessary buy-in, and limits of the assignment or task.
- **"Off the shelf" solution:** A simplistic (generic) option that is familiar from everyday experience but not tailored to the problem at hand (e.g. holding a bake sale to "save" an underfunded public library).
- **Solution:** An appropriate response to a challenge or a problem.
- **Hypothesis:** An educated guess to a challenge or a problem.
- **Strategy:** A plan of action or an approach designed to arrive at a solution. If the problem is a river that needs to be crossed, there could be a variety of approaches, for example, building a bridge with your community or swimming across alone. In addition, an approach may only partially apply and be insufficient, such as the swimmer who doesn't know how to swim.
- **Support:** Specific rationale, evidence, etc. for solution or selection of solution.

Criteria	4	3	2	1	Not Demonstrated 0 (Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark level one performance.) Not demonstrated can be assigned to individual students	Not Applicable (Evaluators are encouraged to assign “not applicable” if student work was not required to address a category. If assignment is used for assessment of all students, all students should be scored as N/A in this category and an explanation is required in space provide on web form.)
Define Problem	Demonstrates the ability to construct a clear and insightful problem statement with evidence of relevant contextual factors.	Demonstrates the ability to construct a problem statement with evidence of most relevant contextual factors, and problem statement is adequately detailed .	Begins to demonstrate the ability to construct a basic or minimal problem statement with evidence of some relevant contextual factors, but problem statement is superficial.	Demonstrates a limited ability in identifying a problem statement, but there are no related contextual factors.	No problem statement and related contextual factors are identified.	Identification of a problem is not required for the assignment
Identify Strategies	Identifies multiple approaches for solving the problem that apply within a specific context.	Identifies multiple approaches for solving the problem, only some of which apply within a specific context.	Identifies only a single approach for solving the problem that does apply within a specific context.	Identifies one or more approaches for solving the problem that do not apply within a specific context.	Does not identify any approaches for solving the problem.	Identifying approaches is not required for the assignment.
Propose Solutions/Hypotheses	Proposes one or more solutions/hypotheses that indicates a comprehensive understanding of the problem. Solutions/hypotheses are sensitive to contextual factors including: ethical, logical, and cultural dimensions of the problem.	Proposes one or more solutions/hypotheses that indicates comprehension of the problem. Solutions/hypotheses are sensitive to contextual factors , including at least one of the following: ethical, logical, or cultural dimensions of the problem.	Proposes one solution/hypothesis that is “off the shelf” rather than individually designed to address the specific contextual factors of the problem.	Proposes a solution/hypothesis that is difficult to evaluate because it is vague or only indirectly addresses the problem statement.	Does not propose a solution/hypothesis.	Proposing a solution/hypothesis is not required for the assignment.

Faculty may need to use multiple assessments to assess all criteria. Resources/ideas for prompts and activities that could be used to assess for the various criteria are available from the Academic Assessment Coordinator, Kristen Kane: kkane@cgcc.edu

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<i>Evaluate Potential Solutions</i>	Evaluation of hypothesis is thorough and insightful and includes all of the following: considers context of problem, reviews logic/reasoning, examines feasibility of solution, and weighs impacts of solution. Specific considerations of need for further work.	Evaluation of hypothesis is adequate (for example, contains thorough explanation) and includes the following: considers context of problem, reviews logic/reasoning, examines feasibility of solution, and weighs impacts of solution. Some consideration of need for further work.	Evaluation of hypotheses is brief and includes the following: context history of problem, reviews logic/reasoning, examines feasibility of solution, and weighs impacts of solution. Little, if any, consideration of need for further work.	Evaluation of hypothesis is superficial (for example, contains surface level explanation) and includes the following: some context history of problem, reviews logic/reasoning, examines feasibility of solution, and weighs impacts of solution. No consideration of need for further work	Hypothesis is not evaluated	Evaluation of hypothesis is not required to be stated for assignment.
<i>Implement Solution</i>	Implements the solution in a manner that addresses thoroughly and deeply multiple contextual factors of the problem.	Implements the solution in a manner that addresses multiple contextual factors of the problem in a surface manner .	Implements the solution in a manner that addresses the problem statement but ignores relevant contextual factors .	Implements the solution in a manner that does not directly address the problem statement.	Solution is not implemented .	Implementation of solution is not required to provide a conclusion for the assignment.
<i>Evaluate Outcomes</i>	Reviews results relative to the problem defined with thorough, specific considerations of need for further work.	Reviews results relative to the problem defined with some consideration of need for further work.	Reviews results in terms of the problem defined with little, if any, consideration of need for further work.	Reviews results superficially in terms of the problem defined with no consideration of need for further work	Results are not reviewed in any terms of the problem.	Results are not required to be reviewed for the assignment.

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