

PCC General Education: Quantitative Reasoning

Discipline Studies Area: Science, Math and Computer Science

Outcome and Rubric, Version 2.5

Outcome Statement

Students completing an associate degree at PCC will be able to:

Analyze questions or problems that impact the community and/or environment using quantitative information.

Rubric Description

Quantitative Reasoning encompasses six dimensions, aligned with the [Associate of Arts Oregon Transfer \(AAOT\) degree outcomes and criteria](#) for Science or Computer Science and Mathematics.

As a result of taking a General Education Science, Math or Computer Science course, a student should be able to:

1. **State the Problem or Question** - State problems or questions clearly and with disciplinary context. This dimension addresses AAOT Science or Computer Science Criteria #1, 2, 3, the additional Computer Science criterion, and Mathematics Criteria # 2, 3, 4, 5, 6, 7.
2. **Determine Information Needed** - Identify and describe the information needed to solve a stated problem or answer a stated question. This dimension addresses AAOT Science or Computer Science Criteria #1, 2, 3, the additional Computer Science criterion, and Mathematics Criteria # 2, 3, 4, 5, 6, 7.
3. **Representation** - Convert data or other information into mathematical form. This dimension addresses AAOT Science or Computer Science Criteria #1 and 2, the additional Science criterion, the additional Computer Science criterion, and Mathematics Criteria #1, 2, 3, 4, 5, 6.
4. **Interpretation** - Convert information presented in mathematical form into words. This dimension addresses AAOT Science or Computer Science Criteria #1 and 2, the additional Science criterion, the additional Computer Science criterion, and Mathematics Criteria #1, 2, 3, 4, 5, 6.
5. **Draw Conclusions** - Develop evidence-based conclusions that consider all relevant data or other information, while also acknowledging the limitations of that data or other information. This dimension addresses AAOT Science or Computer Science Criteria #1 and 2, the additional Computer Science criterion, and Mathematics Criteria #1, 2, 3, 4, 5, 6.
6. **Community & Environmental Implications** - Consider how problems or questions in these disciplines affect the wider community and/or the environment. This dimension addresses AAOT Science or Computer Science Criterion #3, the additional Science criterion, and Mathematics #3, 5, 7.

Rubric

Assignments for General Education assessment must include the following dimensions:

| Dimensions | Levels of Achievement | | | |
|----------------------------------|---|--|--|---|
| | 4: Advanced | 3: Proficient | 2: Developing *PCC benchmark | 1: Emerging |
| 1. State the Problem or Question | Explains a problem or question with clarity and context. | Describes a problem or question with clarity and context. | Partially describes a problem or question with limited clarity and context. | Identifies a problem or question without clarity or context. |
| 2. Determine Information Needed | Thoroughly identifies and describes the information needed to solve the problem or answer the question. | Identifies and describes the basic information needed to solve the problem or answer the question. | Partially identifies the information needed to solve the problem or answer the question. | Significantly misidentifies the information needed to solve the problem or answer the question. |
| 3. Representation | Converts relevant information into complete and accurate mathematical form (e.g., equations, graphs, diagrams, tables, maps, algorithms). | Converts relevant information into accurate mathematical form (e.g., equations, graphs, diagrams, tables, maps, algorithms). | Converts information, but resulting mathematical form (e.g., equations, graphs, diagrams, tables, maps, algorithms) is only partially accurate . | Converts information, but resulting mathematical form (e.g., equations, graphs, diagrams, tables, maps, algorithms) is inaccurate . |

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|---|---|---|---|---|
| 4. Interpretation | Demonstrates sophisticated and accurate understanding in their explanation of information provided in mathematical form. Makes no errors in interpretation. | Demonstrates accurate understanding in their explanation of information provided in mathematical form. Makes no errors in interpretation. | Demonstrates partial understanding in their explanation of information provided in mathematical form. Occasionally makes minor errors in interpretation. Errors are inconsequential. | Demonstrates minimal understanding in their explanation of information provided in mathematical form. Makes consequential errors in interpretation. |
| 5. Draw Conclusions | Develops insightful and carefully qualified conclusions that are based on evidence . Considers all relevant evidence (i.e., does not “cherry-pick”), conclusions are accurate and qualified to consider the limitations of the information available. May consider iterative process and refinement of original problem or question. | Develops qualified conclusions that are based on evidence . Considers relevant evidence (i.e., does not “cherry-pick”), conclusions are accurate and qualified to consider the limitations of the information available. | Develops partially qualified conclusions that are only somewhat based on evidence . Considers some relevant evidence (i.e., may “cherry-pick”), conclusions are somewhat accurate and only partially qualified to consider the limitations of the information available. | Develops conclusions that may not be accurate, qualified or based on evidence . Does not consider relevant evidence (i.e., likely “cherry-picks”), conclusions are not accurate nor qualified to consider the limitations of the information available. |
| 6. Community and Environmental Implications | Describes with sophistication how a stated topic or problem and its potential solutions affect the wider community and/or the environment. | Provides substantial description of how a stated topic or problem and its potential solutions affect the wider community and/or the environment. | Provides partial or limited description of how a stated topic or problem and its potential solutions affect the wider community and/or the environment. | Provides minimal or superficial description of how a stated topic or problem and its potential solutions affect the wider community and/or the environment. |

Performance descriptors are based on Bloom's Taxonomy, a model of cognitive processes that describe skills and abilities on a continuum of educational outcomes. Definitions from [Fresno State University](#).

- **Explain (Level 4-Analysis)** - Student distinguishes, classifies, and relates the assumptions, hypotheses, evidence, or structure of a statement or question.
- **Describe (Level 2-Comprehension)** - Student translates, comprehends, or interprets information based on prior learning
- **Identify (Level 1-Knowledge)** - Student recalls or recognizes information, ideas, and principles in the approximate form in which they were learned.