

ONU General Education Learning Outcome Rubric



Scientific and quantitative literacy:

Students demonstrate an understanding of scientific concepts and the scientific method, and an ability to apply quantitative methods to identify and solve real-world problems.

Dimensions	Does Not Meet Expectations	Developing	Meets Expectations	Proficient
Understanding and Interpretation of Scientific and Quantitative Concepts and Methods Ability to understand the underlying scientific and quantitative concepts and methods as applied to the context.	Attempts to explain underlying scientific or quantitative concepts and methods applied to given context, but has trouble doing so correctly. Frequently makes errors or gives unclear explanations.	Developing the ability to explain underlying scientific or quantitative concepts and methods applied to given context. Makes some errors or gives unclear explanations.	Competently explains underlying scientific or quantitative concepts and methods applied to given context. Rarely makes errors or gives unclear explanations.	Skillfully explains underlying scientific or quantitative concepts and methods applied to given context. Consistently provides clear explanations with no errors.
Representation Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, or diagrams).	Able to identify relevant information, but has difficulty converting it into mathematical forms (e.g., equations, graphs, or diagrams, tables). Frequently makes errors or uses forms that are not the best for the problem at hand.	Developing the ability to convert relevant information into mathematical forms (e.g., equations, graphs, or diagrams, tables). Sometimes makes errors or uses forms that are not the best for the problem at hand.	Generally able to convert relevant information into various mathematical forms (e.g., equations, graphs, or diagrams, tables) accurately. Rarely makes errors and almost always chooses the best form for the problem at hand.	Consistently demonstrates fluency in converting relevant information into various mathematical forms (e.g., equations, graphs, or diagrams, tables). Reliably chooses the best form for the problem at hand.
Calculation	Makes an effort but has trouble doing so correctly.	Performs the calculations correctly, but makes some errors.	Performs the calculations correctly. Rarely makes errors.	Performs the calculations correctly.
Application / Analysis Ability to make judgments	Attempts to make judgments based on quantitative analysis	Makes judgments based on quantitative analysis of data.	Makes informed judgments based on quantitative analysis	Makes informed judgments based on quantitative analysis of data.

based on quantitative analysis of data.	of data. Frequently makes errors or draws unwarranted conclusions.	Occasionally makes errors or draws unwarranted conclusions.	of data. Rarely makes errors or draws unwarranted conclusions.	Consistently draws appropriate conclusions from the data and recognizes the limits of the analysis used.
Estimation / reasonableness checks Reality checks.	Rarely checks answers for reasonableness; not confident in making estimates that require assumptions about unknown quantities; does not perform reality checks on numbers reported by others.	Sometimes checks calculated answers for reasonableness; confident about making estimates that require assumptions about unknown quantities; sometimes performs reality checks on numbers reported by others.	Often checks calculated answers for reasonableness; makes good assumptions for estimation problems that involve unknown quantities; performs reality checks on numbers reported by others.	Consistently checks calculated answers for reasonableness; makes good assumptions for estimation problems that involve unknown quantities; performs reality checks on numbers reported by others.
Communication Expressing a solution so that an audience understands what the solution means.	Attempts to communicate scientific and quantitative information for reader or user, but is unsuccessful at making an argument, selecting an appropriate format, or placing in context.	Communicates scientific and quantitative information for reader or user, but does not constitute a clear or coherent point, chose n format is neither the most effective nor in context.	Clearly communicates scientific and quantitative information for reader or user, although information may not cohere as an argument, solution, or conclusion, may not be in the most effective format or with necessary context.	Clearly communicates scientific and quantitative information for reader or user, shaping it into an argument, solution, or conclusion as appropriate, using a well-chosen, effective format and placing values in context.