

Name:

Date:

Thinking with models _ Linear Functions

Assessment Criterion: A and C

Criterion A: Knowing and understanding.

Achievement Level	IB Criterion A Descriptor (Task-Specific)	Evidence from This Task (Sample Student Response)
0	The student does not reach a standard described by any of the descriptors below.	No attempt or irrelevant work in all questions.
1–2	The student selects limited or inappropriate mathematical knowledge and applies it incorrectly in familiar situations.	Q1: Random matching of equations to graphs. Q2: Describes rainfall and yield verbally with no equation. Q3: States an answer without substitution. Q4: No linear model formed.
3–4	The student selects some appropriate mathematics and applies it partially correctly in familiar situations.	Q1: Correctly matches one graph using slope. Q2: Writes $(y = mx + c)$ but finds incorrect values. Q3: Correct substitution into one equation. Q4: Finds slope but incorrect intercept.
5–6	The student selects appropriate mathematics and applies it mostly correctly when solving problems in familiar and unfamiliar contexts .	Q1: Correctly matches most graphs using slope and intercept. Q2: Correct linear model; minor error when finding yield for 10 inches. Q3: Correctly identifies Lines A and D with working. Q4: Correct model and temperature at 8 min; minor algebra error for 57°C.

7–8	The student selects appropriate and effective mathematics and applies it accurately and consistently to solve problems correctly in a variety of contexts .	Q1: All graphs correctly matched with justification. Q2: Correct linear model and accurate prediction for 10 inches of rainfall. Q3: Clear substitution showing Lines A and D pass through (2,9). Q4: $(T(x)=5x+20)$, $(T(8)=60^\circ\text{C})$, time to reach $(57^\circ\text{C} = 7.4)$ min.
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Criterion C: Communicating

Achievement Level	Criterion C Descriptor (General)	Sample Communication (Linear Functions – Question-wise)
0	Does not communicate mathematical ideas.	No equations, graphs, tables, or explanations shown for any question.
1–2	Uses limited mathematical language and unclear representations; reasoning is disorganized.	Q1: Matches graphs without labels or notation. Q2: Describes context verbally, no equation. Q3: States answer without substitution. Q4: Copies table values with no explanation.
3–4	Uses some appropriate mathematical language and representations, but with errors or missing steps.	Q1: Uses slope or intercept but labels unclear. Q2: Writes $(y = mx + c)$ without defining variables. Q3: Shows substitution but skips steps. Q4: Forms equation but explanation is unclear.
5–6	Uses appropriate mathematical language and representations; reasoning is mostly clear and logically organized.	Q1: Correctly labels slope and intercept. Q2: Defines variables and presents a clear linear model. Q3: Logical substitution with correct notation

		Q4: Moves from table to equation and prediction with mostly clear explanation.
7–8	Uses precise mathematical language, effective representations, and clear, concise, logical reasoning throughout.	Q1: Clearly explains graph–equation matching using notation. Q2: Explains context → variables → equation → interpretation. Q3: Step-by-step algebraic reasoning with conclusion. Q4: Fluently connects table, equation, and interpretation.