

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 <b>limited or inappropriate mathematical knowledge</b> and applies it <b>incorrectly</b> in familiar situations.	<b>Q1:</b> Random matching of equations to graphs. <b>Q2:</b> Describes rainfall and yield verbally with no equation. <b>Q3:</b> States an answer without substitution. <b>Q4:</b> No linear model formed.
3–4	The student selects <b>some appropriate mathematics</b> and applies it <b>partially correctly</b> in familiar situations.	<b>Q1:</b> Correctly matches one graph using slope. <b>Q2:</b> Writes ( $y = mx + c$ ) but finds incorrect values. <b>Q3:</b> Correct substitution into one equation. <b>Q4:</b> Finds slope but incorrect intercept.
5–6	The student selects <b>appropriate mathematics</b> and applies it <b>mostly correctly</b> when solving problems in <b>familiar and unfamiliar contexts</b> .	<b>Q1:</b> Correctly matches most graphs using slope and intercept. <b>Q2:</b> Correct linear model; minor error when finding yield for 10 inches. <b>Q3:</b> Correctly identifies Lines A and D with working. <b>Q4:</b> Correct model and temperature at 8 min; minor algebra error for 57°C.

<b>7–8</b>	The student selects <b>appropriate and effective mathematics</b> and applies it <b>accurately and consistently</b> to solve problems <b>correctly in a variety of contexts</b> .	<b>Q1:</b> All graphs correctly matched with justification. <b>Q2:</b> Correct linear model and accurate prediction for 10 inches of rainfall. <b>Q3:</b> Clear substitution showing Lines A and D pass through (2,9). <b>Q4:</b> $(T(x)=5x+20)$ , $(T(8)=60^{\circ}\text{C})$ , 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)
<b>0</b>	Does not communicate mathematical ideas.	No equations, graphs, tables, or explanations shown for any question.
<b>1–2</b>	Uses limited mathematical language and unclear representations; reasoning is disorganized.	<b>Q1:</b> Matches graphs without labels or notation. <b>Q2:</b> Describes context verbally, no equation. <b>Q3:</b> States answer without substitution. <b>Q4:</b> Copies table values with no explanation.
<b>3–4</b>	Uses some appropriate mathematical language and representations, but with errors or missing steps.	<b>Q1:</b> Uses slope or intercept but labels unclear. <b>Q2:</b> Writes $(y = mx + c)$ without defining variables. <b>Q3:</b> Shows substitution but skips steps. <b>Q4:</b> Forms equation but explanation is unclear.
<b>5–6</b>	Uses appropriate mathematical language and representations; reasoning is mostly clear and logically organized.	<b>Q1:</b> Correctly labels slope and intercept. <b>Q2:</b> Defines variables and presents a clear linear model. <b>Q3:</b> Logical substitution with correct notation

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