Name: ……. Date: ……..

Thinking with models _ Linear Functions

Investigation Task: Mobile screen usage Assessment Criterion: D and C

Criterion D: Apply math in real life context.

Level	Achievement Descriptor	Sample Response
1–2	The student identifies **limited elements** of the mobile screen context. An inappropriate or unclear mathematical strategy is selected. The linear model is applied incorrectly, leading to inaccurate solutions. There is **little or no justification** of accuracy or whether the solution makes sense.	States that battery decreases but does not identify screen time correctly. Writes an incorrect equation. Answers are given without explanation.
3–4	The student identifies **some relevant elements** of the mobile screen situation. A partially appropriate linear strategy is selected. The strategy is applied with **errors** in gradient, equation, or solutions. Justification of accuracy and reasonableness is **brief or unclear**.	Identifies screen time and battery but calculates the rate incorrectly. Forms a linear equation with mistakes. Gives a short statement such as “the answer seems correct.”
5–6	The student identifies **relevant elements** of the mobile screen context. An appropriate linear strategy is selected and applied **mostly correctly**. Solutions are generally correct. The student provides an **adequate justification** of accuracy and explains whether the solution makes sense in the real-life context.	Correctly identifies variables and finds a linear equation. Solves for battery at 5 hours and time at 20% with minor arithmetic or rounding issues. Mentions rounding and real-life variation briefly.
7–8	The student clearly identifies **all relevant elements** of the mobile screen situation. The **most appropriate linear strategy** is selected and applied accurately to reach correct solutions. The student **clearly justifies** the degree of accuracy and **thoughtfully justifies** whether the solution makes sense in the real-life context of mobile screen usage.	Identifies screen time as the independent variable and battery percentage as the dependent variable. Forms the equation (y = -8x + 100), finds 60% after 5 hours and 10 hours to reach 20%. Clearly justifies whole-number battery values and explains limitations of a linear model due to app usage and brightness.

Criterion C: Communicating

Level	Achievement Descriptor	Sample Response
1–2	The student uses **limited or incorrect mathematical language** related to screen time and battery percentage. Mathematical representations are **missing or inappropriate**. Explanations are unclear and information is **poorly organized**.	Writes numbers without units or labels. Does not clearly state variables. The equation is missing or incorrect. Working is not logically ordered.
3–4	The student uses **some correct mathematical language**, but with errors in notation or terminology. Uses a **partially correct representation** (such as an equation or calculation). Explanations are brief and structure is **inconsistent**.	Identifies variables but does not label them clearly. Writes an equation with missing steps. Some calculations are shown, but reasoning is incomplete.
5–6	The student uses **appropriate mathematical language, notation, and symbols** related to linear functions. Uses correct representations such as equations and calculations. Moves between representations with **minor gaps**. Reasoning is mostly clear and work is **logically structured**.	Correctly labels screen time and battery percentage. Writes (y = -8x + 100). Shows calculations step by step with brief explanations. Work is mostly well organized.
7–8	The student uses **precise and consistent mathematical language, notation, and terminology** throughout. Uses **appropriate and multiple representations** and moves fluently between them. Communicates a **complete, coherent, and concise** line of reasoning with a clear logical structure.	Clearly defines variables, correctly uses the equation (y = -8x + 100), substitutes values accurately, and explains reasoning using correct terms such as “gradient” and “linear model.” Work is clearly structured and easy to follow.