MEL Explanation Task Rubrics

Science & Engineering Practice	Science and Engineering Practices Rubric			
	Mastery	**Approaching**	**Developing**	**Beginning**
Developing and Using Models	The explanation clearly and accurately evaluates the merits and limitations of the two different models of the phenomenon in order to select the most plausible model based on the evidence.	The explanation evaluates the merits and limitations of one of the two different models of the phenomenon in order to select the most plausible model based on the evidence.	The explanation has little or no evaluation of the merits or limitations of one of the two different models of the phenomenon in order to select the most plausible model based on the evidence.	The explanation does not evaluate the merits or limitations of either model, or the explanation is erroneous, in order to select the most plausible model based on the evidence.
Engaging in Argument from Evidence	The student's written explanation accurately and precisely identifies the strength or weakness of the evidence to model link based on comparing and integrating how evidence supports or contradicts a particular model using several lines of data from the multiple evidence texts.	The student's written explanation accurately identifies the strength or weakness of the evidence to model link, but the student's analysis may not be well integrated and/or may be missing comparisons to another model, with only a moderate level of justification using the data from the evidence texts.	The student's written explanation has some inaccurate information in identifying the strength or weakness of the evidence to model link, with little integration of the data from evidence texts or weakly justifying their reasoning with evidence from the texts or incorrectly applying one of the evidence pieces.	The student's written explanation conveys inaccurate information or does not identify the strength or weakness of the evidence to model link, with no integration of the data from evidence texts or no justification of their reasoning with evidence from the texts or incorrectly applying several lines of evidence.

Constructing Explanations	The explanation of the evidence to model link is clear and justifications are based on accurate and precise understanding of the scientific content in the evidence texts and scientific reasoning about the causal connection to the model.	The explanation of the evidence to model link is clear but does not provide sufficient justification and may only use a correlational rather than causal explanation based on the scientific content presented in the evidence texts.	The explanation of the evidence to model link displays an error in understanding the scientific content, and/or the explanation is correlational and may convey errors in reasoning, or there is limited reasoning to support the explanation.	The explanation of the evidence to model link displays several errors in understanding the scientific content and there is limited or no reasoning, or completely wrong reasoning to support the explanation.
Analyzing and Interpreting Data	Correctly uses and compares and contrasts data from all evidence texts which contain data representations (tables, graphs), identifies patterns in the data accurately and precisely describing relationships between variables, that support the student's evaluation of the evidence to model link.	Correctly uses data from a couple of the evidence texts with some comparison of the data, identifying some patterns and relationships of the variables and data accurately, to support the student's evaluation of the evidence to model link.	Limited use of data from one evidence texts, with little or light comparison of the data, may identify a singular pattern or relationship of the variables or data, but may be inaccurately analyzed or interpreted to support the student's evaluation of the evidence to model link.	Limited or no use of data from the evidence texts, no comparison of the data, does not identify patterns or relationships of the variables or data, or may be inaccurately performed, with generally inaccurate analysis or interpretation or misunderstanding of the texts, to support the student's evaluation of the evidence to model link.

Crosscutting Concepts Rubric				
Crosscutting Concepts	**Mastery**	**Approaching**	**Developing**	**Beginning**
Cause & Effect	Students demonstrate a clear ability to utilize several pieces from the evidence texts to differentiate between cause and correlation, cite cause and effect relationships to make predictions about the phenomenon on different scales and to different effects.	Students demonstrate the ability to utilize at least two pieces from the evidence texts to differentiate between cause and correlation, and cite cause and effect relationships to make at least one prediction about the phenomenon, but limited to one scale and/or showing one different effect.	Students utilize one line from the evidence text to differentiate between cause and correlation, but may be in error, students make only one prediction citing cause and effect but do not relate to scale or effect type.	Students do not draw from evidence text at all in order to differentiate between cause and effect, only cited the evidence statement, and/or did not make predictions about phenomenon at any level.
Stability & Change	Students are able to clearly and thoroughly explain how both models experience change and what causes those changes, as well as how both models remain the same, using both quantity, temporal and spatial scales, with accurate descriptions of both positive and negative feedback and how they either stabilize or destabilize the model.	Student provides a clear and accurate explanation of how both models experience either change or remain the same but not both, citing either quantity, or spatial or temporal scale; student cites description of either positive or negative feedback and how either stabilize or destabilize the model or system.	Student provides explanation of how one model experiences change or remains the same, but may be in error or incomplete in detail, and only cites one aspect of either quantity, spatial or temporal scale; student cites only positive or negative feedback but may not be detailed as to how model or system is stabilized or destabilized.	Student provides incorrect or incomplete explanation of how one model experiences change or remains the same, and does not provide support in terms of quantity, spatial or temporal scale; student may refer to positive or negative feedback but description is incomplete or in error.