Students will use scientific models to explain biological systems and phenomena

Aspect of "Use of Models in Science"	1 Early Understanding	2 Intermediate Understanding	3 Nuanced Understanding
1. Models are used to make claims and predictions about phenomena or systems **(Purpose of models)**	Students describe the phenomena, generally	Model is used to *provide an explanation* of a specific aspect of the phenomena	Model is used to test a hypothesis or make a prediction
2. Models are evaluated for their ability to represent and explain phenomena **(Explanatory Power)**	No connection made between model features and phenomena of interest to evaluate its ability to explain. The phenomena is discussed generally. No phenomena is highlighted for the model to be evaluated against	Original phenomena is directly compared to model of interest as evidence of explanatory power	Connections are made between model and specific aspects of phenomena that it is supposed to explain
3. Phenomena can be represented by multiple models (Multiple models are valid)	Only a single model is used to explain a phenomenon despite other useful models being available	Multiple models of the same phenomenon are used to depict different object properties or structural features	The relationship between multiple models are used to explain (bolster the explanation of) a phenomenon, acknowledging that they *may* all be valid at the same time
4. Distinguishing between a model and the actual phenomena that it represents (Assumptions and limitations)	A model is described as an exact replication of the phenomena No features, traits, properties, or relationships between model and phenomena are discussed.	Salient features, traits, or properties of the model are described	The model's relationship to the phenomena, including limitations, is justified in order to contextualize an explanation The model is acknowledged to be a short-hand representation, with limitations, that emphasizes aspect of phenomena in question
5. Models are revised to take into account additional information related to the phenomena (used in activities that allow students to create models)	Model iterations are to optimize function, fix errors, or improve aesthetics	Model iterations are to more closely match the original phenomena	Model iterations are to incorporate new findings/information that improve the model's explanatory power