

TABLE 1

## How to incorporate the science practice of developing and using models into a 5E learning sequence.

	<b>Student Task</b>	<b>Role of Teacher</b>
Engage	Students draw an initial model to explain the phenomenon. Students use the model to ask questions and make predictions.	Teachers provoke various viewpoints to help students identify what is uncertain.  Teachers support students as they plan what they will do to answer their questions (or test their predictions).
Explore	Students conduct investigations to answer their questions and test the predictions of their model.	Teachers carefully orchestrate activities that will provide students with evidence to support learning and model revision.
Explain	Students explain what revisions need to be made to the model, using the evidence they have gathered.  Students use the revised model to generate new questions for investigation.	Teachers press students to support their explanations with measurable, observable evidence. Teachers explicitly teach disciplinary core ideas and crosscutting concepts to support sensemaking.  Teachers direct student attention to the unobservable.
Elaborate	Students conduct investigations to gather evidence that supports new aspects of the model, elaborating especially on the unobservable.	Teachers carefully orchestrate activities that will provide students with evidence to support learning and model revision.
Evaluate	Students use the new evidence to evaluate their initial or revised model. Students draw a final model to explain the phenomenon.	Teachers search for generalizations and move students toward consensus. Teachers review disciplinary core ideas and crosscutting concepts. Teachers evaluate student understanding and use the students' explanatory models to inform instruction.