ASET Science & Engineering Practices (SEP) Tool: Asking Questions and Defining Problems

Reviewer Name or ID:
Science Lesson/Unit Title:
Intended grade:

SEP 1	**Asking Questions and Defining Problems:** A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world(s) works and which can be empirically tested. Engineering questions clarify problems to determine criteria for successful solutions and identify constraints to solve problems about the designed world. Both scientists and engineers also ask questions to clarify ideas.

Components of SEP **In this lesson/unit plan, it is clear that *students* have a structured opportunity to:**	**Mark with "x" if present in lesson**	**What teacher actions were taken to facilitate this component for students?**	**What are the students doing?**
1) Ask questions based on observations and/or other appropriate information of a scientific phenomenon			
2) Generate, identify, and/or evaluate questions that can be systematically investigated (i.e., questions that are testable/investigable/scientific)			
3) Ask questions that challenge the premise of an argument or interpretation of a data set *			
4) [Engineering] Define or describe a problem that can be solved (through an object, tool, process, and/or system)			

Notes on Context/Special Considerations (part of school year, differentiation, student developmental considerations, etc.):

* Not present until 6-8 Grade Band

Last Updated 6/4/2019

ASET Grade Band Criteria *(Grade Bands: K-2, 3-5)*

Science & Engineering Practices		
SEP 1: Asking Questions and Defining Problems: Asking questions and defining problems in the K-2 builds on prior experiences and progresses to simple descriptive questions that can be tested. In 3-5 they build on K-2 experiences and progresses to specify qualitative relationships.		
*By the end of the grade band **students** will have had a structured opportunity to develop an understanding of each of these. Individual lessons or units should include opportunities for **students** to practice one or more of the following components ……*		
	K-2 Grade Band	**3 – 5 Grade Band**
1) Ask questions based on observations and/or other appropriate information of a scientific phenomenon	Students generate their own questions based on observations/curiosity/and/or prior experiences to find more information about the natural and/or designed world(s)	Students: a. continue from K-2 to generate their own questions based on observations/curiosity/and/or prior experiences to find more information about the natural and/or designed world(s) b. generate their own questions about what would happen if a variable is changed
2) Generate, identify, and/or evaluate questions that can be systematically investigated (i.e., questions that are testable/investigable/scientific)	Students will ask and/or identify questions that can be answered by an investigation	Students will: a. identify scientific (testable) and non-scientific (non-testable) questions b. ask questions that can be investigated within the scope of the classroom or an outdoor environment and predict reasonable outcomes based on patterns such as cause and effect relationships
3) Ask questions that challenge the premise of an argument or interpretation of a data set *	Not present until 6-8 Grade Band	Not present until 6-8 Grade Band
4) *[Engineering]* Define or describe a problem that can be solved (through an object, tool, process, and/or system)	Students will define a simple problem that can be solved through the development of a new or improved object or tool.	Students will: a. use prior knowledge to describe problems that can be solved b. define a simple design problem that can be solved through the development of an object, tool, process, or system and c. identify and describe criteria (desirable features) for success and constraints (limits) on materials, time, or cost

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