ASET Science & Engineering Practice (SEP) Tool: Engaging in Argument from Evidence

Name or ID:
Lesson/Unit Title:
Intended Grade:

Directions for use

Indicate if a component is present using Y (yes) or N (no) and then, if it is present, fill in the right 2 columns.
A single lesson will most likely not address each of the components below.
The numbering of these components is not meant to indicate they should be used in sequence, they are simply for reference.

SEP 7	**Engaging in Argument from Evidence:** Argumentation is the process by which evidence-based conclusions and solutions are reached. In science and engineering, reasoning and argument based on evidence are essential to identifying the best explanation for a natural phenomenon or the best solution to a design problem. Scientists and engineers use argumentation to listen to, compare, and evaluate competing ideas and methods. Scientists and engineers engage in argumentation when investigating a phenomenon, testing a design solution, resolving questions about measurements, building models, and evaluating claims.

Components of SEP **In this lesson/unit plan, it is clear that students have a structured opportunity to:**	Present? **Y/N**	**What teacher actions were taken to facilitate this component for students?**	**What are the students doing? What sensemaking or intellectual work are students doing?**
1) **Compare, and critique** two arguments based on the supporting evidence			
2) **Engage in discourse** around a scientific argument with peers			
3) **Construct and/or refine** an argument using evidence and reasoning to support a claim			
4) [Engineering] **Make, defend,** and/or **evaluate a** claim about the **effectiveness/ merit** of an object or design **solution** using evidence			

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

Science & Engineering Practices		
SEP 7: Engaging in Argument from Evidence: Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s). In 3-5 they build on K-2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).		
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) **Compare, and critique** two arguments based on the supporting evidence	**Within a given argument**, students: a. **identify claim**s that are supported by relevant evidence b. **distinguish between opinions** (not supported by objective information) and evidence (supported by objective information) in one's own explanations. c. describe how the **evidence do or do not** support the claim and if additional evidence is needed d. **distinguish between explanations** that account for all gathered evidence and those that do not.	Using **two arguments** on the **same topic** developed by students or presented by the instructor: a. **identify claims** made in each argument b. distinguish between **speculation or opinions** (not supported by objective information) and evidence/facts (reasoned judgment based on research findings) used to support each claim c. **evaluate the evidence** to determine its relevance and whether it supports the claim d. describe whether the **given evidence is sufficient** to support the claim and whether additional evidence is needed
2) **Engage in discourse** around a scientific argument with peers	Students will **listen actively** to arguments to: a. indicate agreement or disagreement based on evidence b. retell the main points of the argument	**Respectfully provide and receive critiques** to/from peers about one's explanations, procedures, and models by: a. citing relevant evidence b. posing specific questions that elicit pertinent elaboration and detail.
3) **Construct and/or refine** an argument using evidence and reasoning to support a claim	Students **construct an argument** which includes: a. a claim to be supported about a **phenomenon** b. description of **relevant evidence** (e.g., observations, experiences) to support the claim	Students **construct and/or support** an argument which includes: a. a claim to be supported about a **phenomenon** b. **relevant evidence** (e.g., observations, data, and/or a model) to support the claim c. **reasoning** (explain how the evidence supports/is relevant to their claim.)
4) [Engineering] **Make, defend,** and/or **evaluate a** claim about the **effectiveness/ merit** of an object or design **solution** using evidence.	Students make a claim about the **effectiveness** of an object, tool, or solution that is supported by relevant evidence	Students make a claim about the **merit of a solution** to a problem using relevant evidence about how the solution meets the **criteria and constraints** of the problem

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