

Science and Engineering Practices

The Practices	If I master this practice, that means...
<p>SEP1: Asking questions and defining problems</p>	<ul style="list-style-type: none"> ● I can establish what is already known and determine what questions have yet to be answered. . ● I can ask questions about the texts I read that involve scientific discourse (Connect to the Crosscutting Concepts). ● I can generate a testable question that includes an independent and dependent variable. ● I can define constraints and specifications for a solution. ● I can ask a question that requires evidence to answer.
<p>SEP2: Developing and using models</p>	<ul style="list-style-type: none"> ● I can construct physical, mental and conceptual models to represent and understand phenomena. ● I can use models to explain and predict behaviors of systems, or test a design. ● I can evaluate my models to determine if they accurately represent the phenomena. (Identify limitations and benefits.)
<p>SEP3: Planning and carrying out investigations</p>	<ul style="list-style-type: none"> ● I can identify the factors that must be held constant to control the independent variable. ● I can design and perform experiments to test my hypotheses. ● I can decide what data will be collected (dependent variables) and what tools are needed to collect that data. ● I can evaluate my experiments for flaws that could produce data that is not valid. ● I can refine my experiment when the data I obtain does not answer the question.
<p>SEP4: Analyzing and interpreting data</p> <p>R - Relationship Statement E - Experiment Background S - Solution P - Predict E - Explanation of the science C - Compare two data points</p>	<ul style="list-style-type: none"> ● I can describe data as causal or correlational. ● I can use data as evidence to support a claim. ● I can evaluate if the tools used produced accurate/precise data. ● I can use tables, graphs, spreadsheets, etc. to display and analyze data. ● I can recognize patterns in data and see relationships between variables.

T - Table or graph	
SEP5: Using mathematics and computational thinking	<ul style="list-style-type: none"> ● I express relationships between variables by writing mathematical models (graphs) or equations. ● I use technology to collect and analyze data. ● I use mathematical models and computer simulations to test my predictions and designs. ● I can analyze large sets of data to find patterns. ● I can apply mathematical concepts to science and engineering problems. ● I can use math to support scientific conclusions.
SEP6: Constructing explanations and designing solutions	<ul style="list-style-type: none"> ● I can use relevant data as evidence to support an explanation or conclusion. ● I can design solutions to specific problems within design criteria and constraints. ● I can optimize the performance of a design through testing and retesting. ● I can construct explanations about models, experiments, and phenomena.
SEP7: Engaging in argument from evidence	<ul style="list-style-type: none"> ● I can make oral and written arguments by citing evidence. ● I can support or refute claims using evidence. ● I can evaluate competing design solutions based on design criteria and constraints.. ● I can respectfully provide and receive feedback by asking questions.
SEP8: Obtain, evaluate and communicate information	<ul style="list-style-type: none"> ● I can critically read scientific texts to understand the world. ● I can use qualitative and quantitative data in my writing. ● I can determine if a text is credible, accurate, or biased. ● I can speak and write as a scientist. ● I use scientific text to find important information, evidence and ideas. ● I engage in discussions with scientific peers. ● I evaluate the validity of the findings of others. ● I use multiple sources of information to support my claims.

