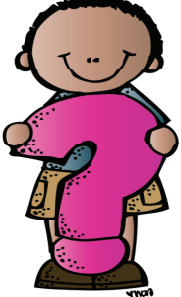
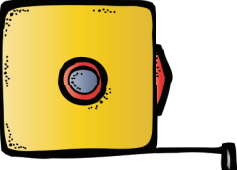




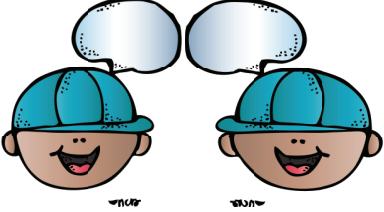
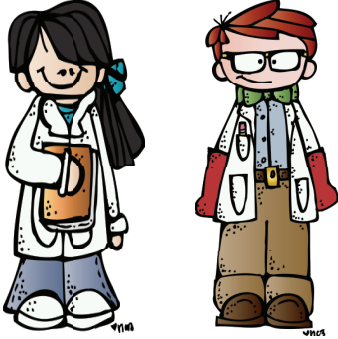


# Eight Science And Engineering Practices

<p>Practice 1</p> 	<p><b>Ask Questions and Define the Problem.</b></p>	
<p>Practice 2</p> 	<p><b>Develop and Use Models.</b></p>	
<p>Practice 3</p> 	<p><b>Plan and Carry Out Investigations</b></p>	
<p>Practice 4</p> 	<p><b>Analyze and Interpret Data</b></p>	
<p>Practice 5</p> 	<p><b>Use Mathematics and Computational Thinking</b></p>	
<p>Science begins with a natural phenomenon and seeks to develop testable answers to the questions.</p>		<p>Engineering begins with a problem, need or desire and creates questions to better define the problem. They determine the criteria for a solution and identify any constraints or limitations that need to be considered.</p>
<p>Science involves the construction and use of models along with simulations to help make predictions that can be tested.</p>		<p>Engineering makes use of models and simulations to analyze existing systems, explore modifications and test proposed solutions.</p>
<p>In Science, investigations are planned to answer the testable question, determine the procedures, identify the variables, define the conditions to be examined and determine how the results will be recorded.</p>		<p>In Engineering, engineers investigation to learn more about the problem to be solved. They identify factors that can impact results and test possible solutions. They consider altering conditions to maximize improvements to meet the criteria and constraints within the scope of the define problem.</p>
<p>Both scientists and engineers use a range of tools (tables, graphs, diagrams and statistical analyses) to identify the significant features and patterns in the data gathered from their investigations.</p>		
<p>Both scientists and engineers use mathematics and calculations as fundamental tools for representing physical variables when recoding and analyzing data.</p>		

<p>Practice 6</p> 	<p><b>Construct Explanations and Design Solutions.</b></p>	
<p>Practice 7</p> 	<p><b>Engage in Argument from Evidence</b></p>	
<p>Practice 8</p> 	<p><b>Obtain, Evaluate, and Communicate Information</b></p>	
<p>In Science, the goal is to construct explanations that reflect the finding of the investigation.</p>		<p>In Engineering, the goal is to propose solutions to the identified problem - satisfying different constraints or criteria.</p>
<p>In Science, reasoning and argument are essential for finding the best explanation for natural phenomenon.</p>		<p>In Engineering, reasoning and argument are used to defend the best possible solution to the problem by using systematic methods to compare another solutions.</p>
<p>Both scientists and engineers must be able to communicate their findings clearly and convincingly - either by writing or orally sharing their finding with tables, graphs, diagrams and equations. They need to be able to obtain meaning from scientific texts to evaluate the accuracy of the information from the sources and incorporate that information into their own findings.</p>		

This table was created by Jennifer Beam, and the information is cited from:

Vasquez, J. A. (2013). *STEM lesson essentials, grades 3-8: Integrating science, technology, engineering, and mathematics*. Portsmouth, NH: Hienemann. pp 30-31.