

The Logic of Science: Physics

Elements of Reasoning

<p>Implications and Consequences <i>Systematical analysis</i></p> <p>Do the assumptions made alter my results?</p> <p>What does the result mean?</p> <p>If I would have obtained a different answer, how would that change my system?</p>	<p>Point of view <i>Looking with careful observation and systematic study</i></p> <p>What does the result mean?</p> <p>Is it possible to obtain the same result from a different approach?</p> <p>Could I use a different equation?</p>	<p>Purpose <i>To figure out</i></p> <p>What is the problem asking for?</p> <p>How is the problem or system set up?</p> <p>By looking at the information given, do I fully understand what the problem is asking me to do?</p>
<p>Assumptions <i>Remember laws at work in the physical world</i></p> <p>What information are they not telling me? Could I assume a value for that?</p> <p>Is the value that I am assuming usually not given in a problem?</p> <p>Why am I making this assumption?</p>		<p>Question <i>What can we figure out</i></p> <p>What is the variable I am looking for?</p> <p>Do I need to do calculations?</p> <p>Do I need to make a graph?</p> <p>What equations do I need?</p> <p>Do I need to refer to previous chapters as well?</p>
<p>Essential Concepts <i>Use of designed hypotheses, predictions, and experimentations</i></p> <p>What are Newton's Laws?</p> <p>What is conservation of Energy?</p> <p>What are the rules of momentum?</p> <p>Do I know and understand the equations that I need?</p>	<p>Interpretation an inference <i>Judgments based on observation</i></p> <p>Are my values given scalar?</p> <p>Are my values given vectors?</p> <p>Do I treat scalar values and vectors the same way?</p> <p>Do I need to manipulate my data before I plug values in the equation?</p>	<p>Information <i>Facts that can be gathered</i></p> <p>What is the information given?</p> <p>Do I need to collect data from a graph or Figure given?</p> <p>Do I need to find more information before I start solving the problem?</p>