

Learning to Think

Critical Thinking www.criticalthinking.org	Science Method The art of making sense ... Ruby	Engineering Process* From Framework page 53 May 2001	Mathematical Problem Solving Modified from George Polya's four step method in his book <i>How to Solve it</i> , by Pat Davidson
What's the author's purpose?	Define the situation Develop a Hypothesis	Identify the need or problem	Understand the problem
What key questions or problems does the author raise?	The precise formulation of the problem Design an Experiment	Research the need or problem	List the key facts given and questions to be answered
What information, data and evidence does the author present	Perform the experiment Observation of the relevant facts	Develop possible solutions	Devise a plan or strategy such as: •Look for a pattern •Look at the basic foundation •Draw a picture or diagram
What key concepts guide the author's reasoning?	The use of previous knowledge	Select the best solutions	Solve the problem
What key conclusion is the author coming to? Are they justified?	Formulation of the explanatory hypothesis	Construct a prototype	Check the results and examine the solution
What is the primary assumption?	Deductions from the hypothesis Form a Conclusion	Test & Evaluate the solution	Communicate the complete solution with proper units and labels
What is the author's viewpoint?	Testing	Communicate the solution	Look back to reflect on the process and other strategies that could have been used
What are the implications of the author's reasoning?	Conclusion: Write a report	Redesign & Renewal	Look ahead to think about how the problem could be extended

“Children must be taught how to think, not what to think.” Margaret Mead

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