

# A Systematic Process for Problem Solving which Requires Critical Thinking



**1** Interpretation  
Team members ask questions to clarify the problem. What is happening, what is the significance and who is involved?

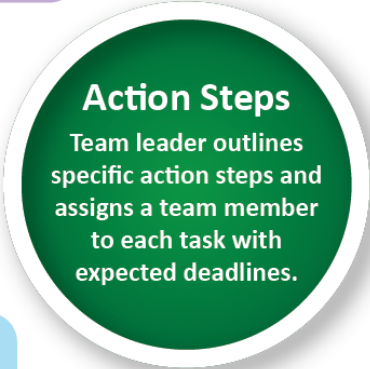
**2** Analysis  
Team members discuss the problem, exploring each person's judgments, arguments, opinions, and conclusions. What evidence is provided to backup the team's experiences, beliefs and opinions shaping the ideas?

**3** Inference  
Team members brainstorm possible solutions using all data and information available. What facts are used to draw reasonable conclusions? What are the possible alternatives? What are the consequences of these conclusions?

▶▶▶ *Take a break for some think time and reflection.* ◀◀◀  
*Gather additional data and information as needed.*

Evaluation **4**  
Team members recap from previous meeting and team lead asks questions about their reasoning and conclusions. Team members evaluate the validity of their argument or solution.

Explanation **5**  
Team members formally verbalize and outline their explanation of their proposed decision or solution.



Self-Regulation **6**  
Team leader questions, confirms, validates and connects the proposed decision or solution to ensure a complete process and conclusion.

*NOTE: Specific questions and descriptions for the process are in the table below.*

# Problem Solving or Decision Making Meeting Agenda

<b>PROBLEM</b>	<p><b>PRESENTATION</b> – The team leader or presenter will describe the facts of the challenge, problem or situation to the team as well as any solutions that have previously been tried.</p>	<p>It is helpful to provide a written description of the problem prior to the session.</p>
<b>1. INTERPRETATION</b>	<p><b>INTERPRETATION</b> – To clarify the problem or situation and ensure that all team members have a common understanding of the issue.</p> <ul style="list-style-type: none"> <li>• Consider the 5W’s: who, what, when, why, where and how</li> <li>• What’s happening?</li> <li>• Who are the people involved?</li> <li>• Who has ownership or a high stake in the process?</li> <li>• What is the best way to characterize, categorize, or classify this?</li> </ul>	<p><b>Team members ask questions to clarify the problem.</b></p> <p>Once the team members feel that they understand the problem deeply, they are ready to move on to ANALYSIS.</p>
<b>2. ANALYSIS</b>	<p><b>ANALYSIS</b> – To discuss the problem thoroughly, exploring the intended and actual inferential relationships among the statements and questions from the team members. Consider each person’s perspective, beliefs, assumptions and opinions. Analyze the facts and any metrics available to corroborate the evidence.</p> <ul style="list-style-type: none"> <li>• Tell us your reasons for making that claim.</li> <li>• What is your conclusion?</li> <li>• What are you claiming?</li> <li>• Why do you think that?</li> <li>• What are the arguments (pros and cons)?</li> <li>• What assumptions must we make to accept that conclusion?</li> <li>• What is your basis for saying that?</li> <li>• What are the underlying or hidden issues?</li> <li>• What would success look like to all of the people involved in the problem?</li> <li>• What has the team leader/presenter contributed to the problem?</li> </ul>	<p><b>Team members discuss the problem, explore each person’s judgements, arguments, opinions, and conclusions. The team leader <u>listens</u> to the discussion.</b></p> <p>Once the team members feels they have explored the questions, they are ready to move on to INFERENCE.</p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>3. INFERENCE</b></p>	<p><b>INFERENCE</b> – To identify and secure elements needed to draw reasonable conclusions. The team will use the data, statements, principles, evidence, beliefs, and opinions from the analysis phase and brainstorm ideas. This is a time to identify possible solutions and discuss the viability of each solution.</p> <ul style="list-style-type: none"> <li>• Given what we know so far, what conclusions can we draw?</li> <li>• Given what we know so far, what can we rule out?</li> <li>• What does this evidence imply?</li> <li>• If we abandoned or accepted that assumption, how would things change?</li> <li>• What additional information do we need to resolve this question?</li> <li>• If we believe these things, what would they imply for us going forward?</li> <li>• What are the consequences of doing things that way?</li> <li>• What are some alternatives we haven't yet explored?</li> <li>• Let's consider each option and see where it takes us.</li> <li>• Are there any undesirable consequences that we can and should foresee?</li> </ul>	<p><b>Team members brainstorm possible solutions using all the information available. The team leader can provide input and direction, if desired.</b></p> <p>Once the team members feels they have explored all the information, data and questions, a break is recommended.</p> <p>When the team reconvenes, they are ready to move on to EVALUATION, starting with a recap of the process and possible solutions.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>4. EVALUATION</b></p>	<p><b>EVALUATION</b> – To assess the credibility of the solutions from the inference phase and review any new evidence and ideas generated since the prior session. Evaluate with fresh eyes the validity of the possible solutions and probe for weaknesses in thinking and logic.</p> <ul style="list-style-type: none"> <li>• How credible is the claim?</li> <li>• Why do we think we can trust what this person claims?</li> <li>• How strong are those arguments?</li> <li>• Do we have our facts right?</li> <li>• How confident can we be in our conclusion, given what we now know?</li> <li>• What are the consequences of this solution?</li> <li>• What would it look like in a year if we implemented this solution?</li> </ul>	<p><b>Start by recapping the process, possible solutions and how the team arrived at them.</b></p> <p><b>Team leader asks questions about the possible solution. Then team members evaluate the validity of their argument or solution.</b></p> <p>Once the team members feel they have thoroughly evaluated their argument or solution, they are ready to prepare their EXPLANATION and consider action steps.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>5. EXPLANATION</b></p>	<p><b>EXPLANATION</b> – To describe the process the team went through to arrive at the solutions. Clarifying the thinking process provides context for how the thought process evolved.</p> <ul style="list-style-type: none"> <li>• What were the specific findings or results of the investigation?</li> <li>• Describe how you conducted that analysis.</li> <li>• How did you come to that interpretation?</li> <li>• Take us through your reasoning one more time.</li> <li>• Why do you think that was the right answer or the solution?</li> <li>• How would you explain why this particular decision was made?</li> <li>• What is the context in which you made this decision?</li> </ul>	<p><b>Team members verbalize and outline their explanation of their proposed decision or solution.</b></p> <p>Once the team members have consensus on the proposed decision or solution, they present to the leader.</p>

<b>6. SELF-REGULATION</b>	<p><b>SELF-REGULATION</b> – To consciously check your thinking and evaluate your potential biases. Evaluate the team’s inferential judgments with a view toward questioning, confirming, validating, or connecting either one’s reasoning or one’s results.</p> <ul style="list-style-type: none"> <li>• Our position on this issue is still too vague. Can we be more precise?</li> <li>• How good was our methodology, and how well did we follow it?</li> <li>• Is there a way we reconcile these two apparently conflicting conclusions?</li> <li>• How good is our evidence?</li> <li>• OK, before we commit, what are we missing?</li> <li>• I’m finding some of our definitions a little confusing. Can we revisit what we mean by certain things before making any final decisions?</li> </ul>	<p><b>Team leader questions, confirms, validates and connects the proposed decisions or solutions to ensure a complete process and conclusion.</b></p> <p>Once the team has reflected and feels confident in the solution, prepare to create specific action steps.</p>
<b>EXECUTION</b>	<p><b>ACTION STEPS</b> – The team leader or facilitator outlines <u>specific action steps</u> and assigns a team member to each task with expected deadlines.</p> <p>Finally the team leader closes the process by asking for the team’s input on the process. What worked well and what can be improved for future problem solving sessions.</p>	<p>It is helpful to put the action steps into a shared document so all team members can monitor the implementation.</p>

**Summary**

Using this process will not only aid your team in making well thought-out decisions on complex and ill-defined problems, but it will also provide a foundation for your team members to practice their critical thinking skills. When asking for feedback on any project, your team will learn to pose a series of questions first rather than stating their opinion. This is a reflective practice that creates deeper thinking and a meaningful conversation about the work.

Consider this process for strategic planning, project management, evaluating business processes, listening to co-workers, mediating conflicts and solving complex problems. Find the root cause, make informed decisions, and be sure to execute with trackable action steps!

**Sources:**

Lamm, A. J. (2015). Integrating Critical Thinking into Extension Programming #1: Critical Thinking Defined. University of Florida. <http://www.edis.ifas.ufl.edu/>.

Facione, P. (2007). Critical thinking: What it is and why it counts. Millbrae, CA: Insight Assessment, California Academic Press.

American Philosophical Association, *Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction*. "The Delphi Report," Committee on Pre-College Philosophy. (ERIC Doc. No. ED 315 423). 1990

For more information on critical thinking styles, visit UF Critical Thinking Inventory <http://www.ufcti.com/> and the UF/IFAS Center for Public Issues Education (PIE center) <http://www.piecenter.com/>.