

Problem Solving

8n – Analyze complex concepts and projects into their constituent parts and synthesize them to create new understanding.

8o – Propose and evaluate a variety of solutions.

8p – Identify obstacles and challenges.

8q – Use models and simulations to explore complex systems and issues.

8s – Troubleshoot systems and applications.



Mastery

You will know you are at the **Expert** level in the use of this ATL skill set when you are a good problem solver.

Finding the best answer or solution to problems requires the application of both analytical thinking, to break down the issue into its component parts and look at the evidence; and creative thinking, to generate multiple possible solutions or answers.

To find solutions and solve problems you first need to focus on thoroughly understanding the issue and becoming very clear about what the real problem is. Be aware that for many real-world problems there is not one magic solution, there is often a range of possible solutions; each of which may have positive and negative effects. The best solution is the one that, looking back from the future, had the most positive effect. Being a good problem solver means being able to pick that particular solution in advance.

Exercise 1 – Global and local problems

Get into a group of four and, as a group, work your way through the process of problem solving for Problem 1. Some of the answers are supplied, some you will have to generate for yourselves. Work through the table by following the steps below and filling in the gaps as you go:

- Gather all the facts – ask who, what, where, when, why & how?
- Define the real problem.



Problem 1	
Give the problem a name.	The unequal distribution of resources between people in the world.
What is the symptom of the problem that you have observed?	Many poor people, a few rich people in the world.
Do your research – what are the facts?	80% of the world's population survive on less than (\$US) \$10/day, 50% live on less than \$2.50/day. Check these facts, find a reference.

Who?	
What?	What is the total \$ cost of one day of your life? You might like to ask your parents for an estimate or try and work one out for yourself.
Where?	Where do the richest and the poorest people in the world live? Research, reference.
When?	When in history did we first get a separation between rich and poor people? Research, reference.
Why?	Why does a distinction between rich and poor come about? Research, reference.
Define the real problem – as a question	How can all people have equal access to all the world's resources?

- c) Come up with one local example of this problem, or the consequences of this problem, that you have noticed in your local school or home community.
- d) Brainstorm possible solutions – get a large piece of paper and write a description of the local example of the problem in the middle. Have everyone in your group take a pen and write anything and everything they can think of that might be a possible solution to the local problem on the page, all at once – for 5 minutes – no restrictions, anything is OK.
- e) Working together, go through every solution written on the page and first eliminate the impossible ones. For each of those that remain, come up with at least one positive and one negative.
- f) Weigh up all the +'s and -'s and decide on the best three solutions – you might want to do this by vote in your group.
- g) Brainstorm again, this time trying to think of any ways in which each of your best three solutions could go wrong.
- h) Choose your best solution and work through the next table:



Our local example of this problem is...	
Our solution to the local problems is...	
The obstacles and challenges we anticipate we will face in getting our solution happening are...	
How will we overcome those is...	
We will know we have been successful in solving the local problem when...	

- i) Now you need to put in place the solution to your local example of the bigger problem.
- j) Decide who will do what, how and by when, and how you will monitor progress in achieving your goal.
- k) When you have everything organized and are ready to implement your solution to the local problem, be sure you make the solution process a loop where at every step you take action. Observe the results, learn from every result, make changes to your solution and take a new action.
- l) Each time you learn from your experience, you may find that you need to change your definition of the problem as well – as you get closer to the actual, real problem.



Define the local problem	Action	Result	Learning	Changes
	1.			
	2.			

	3.			
	4.			

m) The last part of the process is “scale-up.” Can you use your experience of solving the local problem to come up with a solution to the bigger problem? What might be a possible solution to the global problem as defined initially?

n) Fill in the last table.

One global solution to this problem is...	
The main obstacles to achieving this are...	
What would need to happen first for the global solution to be possible?	
What action could you take locally to highlight this problem and your possible global solution?	

Exercise 2 – Your own problem

- Generate your own problem to solve from within a subject or from your community, family or social life.
- Give your problem a name and work your way through all the same steps you took in Exercise 1.

