Chapter 21: Find Solutions—Solving problems **Cheatsheet for Solving Problems: Engineering Design Process** Ask What is the Share problem? **Research** previous Make a poster or a solutions. video to share your invention with the world! 1 Imagine 6 Brainstorm a variety 2 Repeat the cycle Test & of ideas that might to keep improving address the problem. 5 your invention! Improve Test the prototype, and use the results to tweak your design Plan and test it again. Pick your favorite Create idea and work out Make a prototype the details of how to make it happen. of your solution. The more realistic it is, the more useful your testing will be.

Learn how to use this from the book: **CRITICAL THINKING: Teach your kid** how to be smart, make good decisions, and get things done, by C. H. Dadmun



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Chapter 21: Find Solutions—Solving problems

## **Cheatsheet for Solving Problems: Strategies for Getting Unstuck**

- 1. Go for a walk, take a shower, or sleep on it
- 2. Talk it out
- 3. Draw a diagram, make a model, organize information, look for patterns
- 4. Solve a different problem—a simpler one, the opposite, or work backwards
- 5. Go "bird by bird", break a complex problem into parts
- 6. Get the right tool for the job (Is there a method for this kind of problem?)
- 7. Jury-rig it or use "percussive maintenance" (Use the wrong tool for the job!)
- 8. Brute force it, guess and check, list all the wrong solutions
- 9. Start with first principles
- 10. Ask someone new or surprising for help
- 11. Question your assumptions, think outside the box
- 12. Identify the fundamental goal (Is something else the real problem?)
- 13. Embrace the imperfect
- 14. Wait and see
- 15. Live with it

## Break out of your mental constraints! Approach the problem from a new perspective.

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