AI-Powered Problem-Solving & Brainstorming Cheat Sheet

From Vague Challenges to Actionable Solutions with ChatGPT

Introduction:

This cheat sheet provides a structured, AI-enhanced approach to problem-solving, from initial problem definition to solution evaluation and implementation planning. It combines the SOLVE framework for problem framing with the PROMPT framework for crafting powerful AI prompts and incorporates advanced techniques to maximize your results.

I. Problem Framing with SOLVE 2.0 (Enhanced)

Before brainstorming, create a crystal-clear problem statement using the enhanced SOLVE 2.0 framework:

- **S - Situation:**
  - Describe the *current state* and the *specific problem* concisely and factually.
  - Include *quantifiable metrics* where possible (e.g., "Sales have declined by 15% in Q3").
  - *Context Anchors:* Briefly mention relevant market trends or industry context.
  - Example: *"Our new language learning app has 50,000 downloads, but only 22% of users are still active after 30 days (industry average is 45%)."*

- **O - Obstacles:**
  - Identify the *challenges* and *roadblocks* preventing you from reaching your goal. Go beyond surface symptoms.
  - *3-Layer Obstacle Analysis:*
    - **Surface Symptoms:** (e.g., "Low user engagement")
    - **Operational Barriers:** (e.g., "Users find the lessons too difficult," "The app lacks key features")
    - **Systemic Constraints:** (e.g., "Our competitor has a stronger brand presence," "The market is saturated")
    - *Cognitive Biases Check* "Are we assuming because of confirmation bias"
  - Example: "*Users find the initial lessons too difficult and overwhelming (surface). The app lacks personalized learning paths (operational). Competitor apps offer gamified learning and social features (systemic)."*

- **L - Limitations:**
  - Outline any *constraints* or *restrictions* (time, budget, resources, technology, regulations, etc.).
  - *Categorize Limitations:*
    - **Hard Constraints:** (Laws, physics – non-negotiable)
    - **Soft Constraints:** (Budget, internal policies – potentially negotiable)

- **False Constraints:** (Assumptions that *might* be challenged)

- **V - Vision:**
    - Define your *desired outcome* or *goal*. Be specific and measurable (SMART+ goals).
    - *SMART+ Goals:* Specific, Measurable, Achievable, Relevant, Time-bound, *Ethical*, *Resilient*.
    - Add *Qualitative aspects*: What *feel* or *experience* do you wish to create
    - Example: *"Increase 30-day user retention to 40% (+18 percentage points) within two development sprints (8 weeks) while maintaining a user satisfaction rating (NPS) of at least 45, staying with the defined budget"*

- **E - Expectations:**
    - Identify *key stakeholders* and their individual expectations.
    - *Stakeholder Power Map:* Create a simple list or table:

Stakeholder	Must-Have Expectations	Nice-to-Have Expectations
Investors	Measurable ROI, rapid growth	New features
Users	Easy onboarding, engaging content	Social features
Development Team	Feasible timeline, clear specs	Opportunities for learning

Address Conflicting Expectations: Acknowledge and plan for potential conflicts upfront.

II. Enhanced Prompt Engineering: PROMPT Framework

Use this framework to craft precise and effective prompts for ChatGPT:

- **(P)urpose:** What *specific task* do you want the AI to do? (Analyze, brainstorm, evaluate, write, etc.) *Can often be stacked*
- **(R)ole:** What *persona* should the AI adopt? (Consultant, expert, customer, competitor, etc.) *Can be multiple personas*
- **(O)utput:** What *format* and *length* should the response be? (List, table, explanation, code, email, etc.) *Can include negative output*
- **(M)arkers:** What *keywords*, *data points*, *constraints*, and *requirements* are essential? (Include specific metrics, limitations from SOLVE, etc.)
- **(P)atterns:** Are there any *templates, examples, or styles* the AI should follow (Few-shot learning)? *Can also include data validation*.
- **(T)one:** What *style* and *voice* should be used? (Formal, informal, analytical, creative, etc.)
- **Chain-of-Thought:** Add *"Explain your reasoning step-by-step."* for transparency.
- **Anti-Hallucination:** Add: *"Only include information directly supported by the provided data/context. Cite sources if applicable." or "Stop if you reach any information gaps"*

- **Precision Triggers:** Use phrases like: *"Prioritize solutions with...", "Focus exclusively on...", and "The most critical factor is..."*

III. AI-Powered Problem Solving & Brainstorming Prompts

(A) Problem Analysis Prompts (Using Your SOLVE 2.0 Statement):

1. **Root Cause Analysis (5 Whys + Chain-of-Thought):**
    - **Prompt:** *"We have this problem: [Paste your SOLVE statement]. Act as a consultant and help me identify potential root causes using a '5 Whys' approach. Start with the Situation and repeatedly ask 'Why?' (at least five times, or until you reach fundamental causes). Explain your reasoning step-by-step for each 'Why?' question, showing your chain of thought."*
    - **When to Use:** To drill down beyond surface symptoms and uncover underlying causes.

2. **Problem Reframing (Multiple Perspectives):**
    - **Prompt:** *"We have this problem: [Paste your SOLVE statement]. Reframe this problem from the perspective of a [Role 1 - e.g., customer], a [Role 2 - e.g., competitor], and a [Role 3 - e.g., industry expert]. For each perspective, describe how they would view the problem and what their priorities might be."*
    - **When to Use:** To gain new insights and potentially uncover hidden aspects of the problem.

3. **Data Gathering Guidance (Prioritized):**
    - **Prompt:** *"Based on this problem statement: [Paste your SOLVE statement], what specific data points or information would be MOST helpful to gather FIRST to better understand the problem and its causes? Prioritize data based on its potential impact on understanding the problem, the feasibility of obtaining it, and its direct relevance to the SOLVE statement. Suggest both internal and external data sources."*
    - **When to Use:** To identify the most critical information needed for a data-driven analysis.

4. **Assumption Identification:**
    - **Prompt:** *"Based on this problem statement: [Paste your SOLVE statement], what are the underlying assumptions we are making about the situation, the obstacles, and the desired outcome? Identify at least three key assumptions and explain why they might be risky."*

- **When to Use:** To surface hidden assumptions that could be influencing the problem definition.

5. **Stakeholder Impact Analysis:**

- **Prompt:** *"For this problem: [Paste your SOLVE statement], identify the key stakeholders involved. How are they affected by the problem (quantify if possible), and what are their likely perspectives and priorities? Create a table summarizing this information."*
- **When to Use:** For complex problems with multiple parties, ensure all perspectives are considered.

(B) Brainstorming Prompts (Generating Solutions):

6. **General Brainstorming (Role & Constraints):**

- **Prompt:** *"Act as a [Role - e.g., experienced entrepreneur, marketing expert, product designer]. Generate [Number] diverse and creative solutions to address this problem: [Paste your SOLVE statement]. Consider our limitations: [Summarize SOLVE Limitations]. Prioritize solutions that are [Prioritization Criteria - e.g., cost-effective, quick to implement, high-impact]."*
- **When to Use:** To generate a wide range of potential solutions, leveraging a specific expert perspective and considering constraints.

7. **Few-Shot Brainstorming (Guided Creativity):**

- **Prompt:** *"Here are a few examples of successful solutions in similar situations: [Provide 2-3 BRIEF, RELEVANT examples]. Now, act as a [Role] and generate [Number] solutions for this problem: [Paste your SOLVE statement], drawing inspiration from the examples but adapting them to our specific context. Explain how each solution addresses the key Obstacles and Expectations outlined in the SOLVE statement."*
- **When to Use:** To guide the AI's brainstorming towards a particular *type* of solution while still encouraging originality.
- **Example Examples (for the language learning app):**
  - **Example 1:** "Duolingo uses gamification (points, streaks, leaderboards) to increase user engagement."
  - **Example 2:** "Memrise uses spaced repetition and mnemonic devices to improve memory retention."
  - **Example 3:** "Babbel offers short, focused lessons designed for busy learners."

8. **Constraint-Based Brainstorming (Forced Innovation):**
    - **Prompt:** *"Generate solutions for this problem: [Paste your SOLVE statement]. The solution MUST [Constraint 1 - e.g., cost less than $1000] and MUST NOT [Constraint 2 - e.g., require hiring new staff]. Explain how each solution meets these constraints."*
    - **When to Use:** To force creative thinking within specific, *challenging* limitations.

9. **Unconventional Approaches (Breaking Assumptions):**
    - **Prompt:** *"Generate 3 unconventional or 'outside-the-box' solutions to address this problem: [Paste your SOLVE statement]. Challenge common assumptions about how this type of problem is usually solved."*
    - **When to Use:** To overcome mental blocks and explore potentially disruptive solutions.

10. **Analogical Brainstorming (Cross-Domain Inspiration):**
    - **Prompt:** *"Act as a creative problem-solver. We have this problem: [Paste your SOLVE statement]. Brainstorm solutions by drawing analogies from [Field 1 - e.g., nature, biological systems], [Field 2 - e.g., urban planning], and [Field 3 - e.g., military strategy]. How might principles or solutions from these seemingly unrelated fields inspire novel approaches to our problem?"*
    - **When to Use:** To generate truly innovative solutions by seeking inspiration from distant domains.

11. **Reverse Brainstorming (Inverted Thinking):**
    - **Prompt:** *"Act as a devil's advocate and a problem-solving expert. We have this problem: [Paste your SOLVE statement]. Instead of brainstorming solutions, brainstorm a list of ways we could *intentionally make this problem WORSE* or more intractable. Then, for each 'worsening' idea, reverse it to generate a potential solution or preventative measure."*
    - **When to Use:** To uncover hidden assumptions, identify potential pitfalls, and generate solutions by approaching the problem from an inverted perspective.

(C) Solution Evaluation Prompts:

12. **Pros and Cons Analysis:**
    - **Prompt:** *"Create a pros and cons list for each of these solutions: [List the solutions]. Consider the elements of our SOLVE statement (Situation, Obstacles, Limitations, Vision, Expectations) when evaluating."*

- **When to Use:** To systematically weigh the advantages and disadvantages of each potential solution.

13. **Evaluation Matrix (Prioritization):**

- **Prompt:** *"Create an evaluation matrix for these solutions: [List the solutions]. Use these criteria: Cost (weighted [percentage]%), Potential Impact (weighted [percentage]%), Feasibility (weighted [percentage]%), Time to Implement (weighted [percentage]%), and Ethical Alignment (weighted [percentage]%). Score each solution on a scale of 1-5 for each criterion. Justify each score. Based on the weighted scores, suggest a prioritized ranking of the solutions."*
- **When to Use:** To provide a structured, quantitative (and qualitative) comparison of solutions based on multiple weighted criteria.

14. **Risk Assessment (and Mitigation):**

- **Prompt:** *"For each of these solutions: [List the solutions], identify the potential risks and challenges associated with implementation. For each risk, suggest mitigation strategies and estimate the probability (High/Medium/Low) and potential impact (High/Medium/Low) of the risk occurring."*
- **When to Use:** To proactively identify and address potential problems with each solution.

15. **Pre-Mortem Analysis (Failure Prediction):**

- **Prompt:** *"Imagine we've implemented this solution: [Describe the solution]. It has failed completely. Brainstorm all the possible reasons *why* it might have failed. Be specific and consider all aspects of the problem (as defined in our SOLVE statement)."*
- **When to Use:** To proactively identify potential failure points *before* implementation.

16. **ROI Estimation (Financial Justification):**

- **Prompt:** *"Estimate the potential short-term and long-term ROI (return on investment) for each of these solutions: [List solutions], taking into consideration the cost, benefits, and the limitations listed: [Paste your SOLVE limitations].*
- **When to Use:** To get a financial perspective, especially for investors.

17. **Stakeholder Impact Analysis (Beyond SOLVE):**

- **Prompt:** *"For the solution: [Paste Solution]. What impact will it have on various stakeholders (Internal and External)."*

- **When to Use**: Consider wider impacts

18. **Implementation Plan:**
    - **Prompt:** *"Based on the solution you ranked highest, create a detailed plan to put it into action, including a timeline, specific tasks for the team and resources required."*
    - **When to use:** To plan for a project.

IV. Troubleshooting (When AI Isn't Helping):

- **Problem:** AI response is too general or vague.
  - **Solution:** Add more specific *Markers* to your prompt (keywords, constraints, desired output format). Use follow-up prompts like: "Can you be more specific about...?", "Give me concrete examples of...", and "Focus specifically on [aspect of the problem]."
- **Problem:** AI is "hallucinating" or providing incorrect information.
  - **Solution:** Always verify AI-generated information with reliable sources. Re-prompt, emphasizing the need for factual accuracy. Add: "Only include information that can be verified with credible sources."
- **Problem:** AI is stuck in a loop or repeating itself.
  - **Solution:** Rephrase your prompt significantly. Try a different "Role" or a different prompting technique (e.g., switch from general brainstorming to Few-Shot).
- **Problem:** AI doesn't understand the context.
  - **Solution:** Provide *more* context upfront. Use the full SOLVE statement. Break down complex requests into smaller, simpler steps (chained prompts).

V. Key Principles for AI-Powered Problem Solving:

- **SOLVE First, Prompt Second:** A well-defined problem is *essential* for effective AI interaction.
- **PROMPT is Your Best Friend:** Master the art of crafting precise, detailed prompts.
- **Iterate, Iterate, Iterate:** Don't expect perfection on the first try. Refine your prompts, provide feedback, and ask follow-up questions.
- **Combine Techniques:** Use a combination of problem-framing, brainstorming, and evaluation prompts for a comprehensive approach.
- **Human Expertise is Crucial:** AI is a powerful tool, but *your* critical thinking, domain knowledge, and ethical judgment are irreplaceable. Always review, validate, and refine AI-generated outputs.
- **Document all steps:** Keep track of prompts used, AI's responses, solutions, and next steps.

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