

The Science and Philosophy of Better Questions: Field Manual for Question Types and Effective Inquiry

Introduction

Asking the right questions is a powerful, yet often overlooked, skill. Good questions open lines of communication, drive analysis, reveal information, and spur creativity ¹. In science and decision-making alike, a well-formulated question is the first step toward clarity: *“Without a well-focused question, it can be very difficult and time consuming to identify appropriate resources and search for relevant evidence.”* ². This field manual presents a rigorous framework for **Question Engineering** – a practical approach to formulating, refining, and sequencing questions to improve inquiry in any domain.

Why focus on questions? Because the quality of answers (and decisions) we get depends on the questions we ask. Great questions accelerate learning, avoid misunderstandings, and drive deeper inquiry. They help us distinguish facts from values, causation from correlation, and big-picture goals from narrow tasks. By mastering different *types* of questions and knowing when to use each, you can convert vague curiosity into disciplined investigation. In short, better questions lead to better answers and outcomes ¹.

Core Principles of Effective Inquiry: Before diving into question types, keep in mind a few non-negotiable rules for good questioning practice (inspired by the Socratic and scientific methods):

- **Ask one thing at a time:** Separate mixed questions. Don't pack multiple issues or claim types into one question – untangle descriptive vs. normative vs. causal parts.
- **Declare the question's job:** Be clear on what you're asking for – a fact, an explanation, an evaluation, an example, etc. Every question should signal its purpose.
- **Know what counts as an answer:** For each question, think about what evidence or reasoning would satisfactorily address it. Define *answer criteria* (e.g. what data would answer this?).
- **Set a stop condition:** Decide what would make the question “answered enough.” This prevents endless rabbit holes. Once you've met your criteria or found a conclusive answer, you can move on.
- **Use question sequences:** Rather than expecting one perfect question to solve everything, use a series of questions. Start broad then drill down, or start narrow then zoom out – but plan a progression.
- **Theory and practice:** We will build both a conceptual taxonomy of questions (the “Question Atlas”) and practical tools (checklists, rubrics, examples) to apply on the fly.

With these principles in mind, let's map out the terrain of question types and learn how to deploy each for maximum impact.

Question Type Atlas (Taxonomy of Inquiry)

Different questions serve different functions in an investigation. Here we categorize **14 functional types of questions** commonly used across science, philosophy, journalism, law, and everyday problem-solving. Each type is a tool with distinct uses, strengths, and pitfalls. Understanding these categories will help you choose the right question for the job.

Below, each **Question Type Card** details the type's purpose, best use cases, prerequisites (what you should know first), common mistakes, what good answers look like, when to stop, and how to follow up. We also provide a **weak example** and an improved **strong example**, including a brief rewrite demonstration.

1. Descriptive Questions

- **Function:** To **describe facts or characteristics** of a phenomenon. These questions ask “what is” or “what happened,” seeking *descriptive* knowledge about the world ³. They quantify, catalog, or detail something.
- **Best contexts:** Use descriptive questions when you need **baseline facts or a status quo**. In science or journalism, these gather observational data (e.g. “What is the current inflation rate?”). In history: “What events occurred?” In medicine: “What symptoms are present?”
- **Prerequisites:** Often none beyond basic curiosity – these can be starting questions. However, you should have clearly defined terms (ask **definitional questions** first if needed to clarify what you’re describing).
- **Bad-use warnings:** A descriptive question that is too broad (“Tell me everything about X”) fails because it lacks focus or scope. Also, avoid mixing in causes or judgments (don’t ask “What happened *and is it good?*” – separate the factual “what” from any evaluation).
- **Typical evidence:** Factual **observations, measurements, records, or descriptions** from credible sources. Good answers might be statistics, concrete details, or summary of observations.
- **Stop condition:** You have a sufficiently detailed and accurate picture of “what is/was.” For example, you’ve gathered enough data to confidently describe the state of affairs or answer who/what/when/where.
- **Follow-on types:** Descriptive answers often prompt **causal** (“why is that the case?”) or **comparative** (“how does this compare to Y?”) questions. They can also lead to **interpretive** questions (“what does this mean?”) once facts are in place.
- **Example (weak):** “What’s going on with climate change nowadays?” – (*Vague and overly broad: “going on” and “nowadays” are not clear; mixes various issues.*)
Improved (strong): “What are the current global average temperature and CO₂ levels, and how have they changed over the past 50 years?” – (*Focused on specific descriptive facts with scope – measurable climate indicators over a timeline.*)
Rewrite demo: The weak question is refined by specifying **which aspects** of climate change (temperature, CO₂), giving a **time frame** (past 50 years), and making it answerable with data. This yields a clear, fact-based question that invites concrete evidence (NASA’s data, NOAA reports, etc.).

2. Definitional Questions

- **Function:** To **define or clarify the meaning of terms or concepts**. These questions ask “What does X mean?” or “How should we define Y?” They ensure everyone is on the same page about terminology or criteria.

- **Best contexts:** Use definitional questions whenever a key term or concept is **ambiguous, controversial, or complex**. In philosophy or law, for instance, “What counts as ‘freedom of speech’ under the law?” In science, “How exactly is ‘intelligence’ defined in this study?”
- **Prerequisites:** Recognition that a term is pivotal but unclear. It helps if you suspect different interpretations exist. No other knowledge is needed, but often definition questions follow an initial broad question (you realize you must define X before proceeding).
- **Bad-use warnings:** Be careful of **circular definitions** (“X is when you have X”) or definitions that are too broad/narrow to be useful. Also, avoid loaded definitions that smuggle in an argument. For example, asking “Doesn’t ‘freedom’ really mean doing whatever you want?” presupposes a particular stance. Instead, neutrally ask “What are the various definitions of ‘freedom’ in context A versus context B?”
- **Typical evidence:** Reference to **established definitions** (dictionaries, scholarly sources, legal statutes) or logical criteria. In debates, it may involve offering **stipulative definitions** for the sake of argument.
- **Stop condition:** You have a clear, agreed-upon definition or at least have mapped the range of definitions. The term is no longer causing confusion in your inquiry.
- **Follow-on types:** Once terms are defined, you can move to **descriptive** or **evaluative** questions using that definition. Also, definitional clarity can surface **comparative** or **normative** questions (comparing definitions or assessing which definition should be adopted).
- **Example (weak):** “What is democracy, really?” – (*Too vague/general; “democracy” has volumes of definitions – question lacks context or purpose.*)
Improved (strong): “In political science, how is a ‘democracy’ formally defined in terms of citizen participation and institutional structure?” – (*Scoped to political science, focusing on key aspects, invites an authoritative definition.*)
Rewrite demo: The weak question “What is democracy?” is unfocused – we refine it by specifying **discipline/context** (political science), and **key dimensions** we care about (citizen participation, institutions). Now the question seeks a clear, scholarly definition.

3. Mechanistic (Explanatory) Questions

- **Function:** To **explain how something works** – the underlying mechanism or process. Mechanistic questions break phenomena into parts or steps: “How does X lead to Y?” or “What is the process by which...?”
- **Best contexts:** Use when you need a **deeper understanding of cause-and-effect dynamics** or system behavior. For example, “How do vaccines trigger an immune response?” in biology (mechanism of action), or “By what mechanism does inflation rise when the money supply increases?” in economics.
- **Prerequisites:** Typically, some descriptive knowledge of the phenomenon (you know *what* happens, now you want to know *how*). Also, often you need a **causal question** answered at a high level before asking for the detailed mechanism (e.g. first establish *that* X affects Y, then ask *how*).
- **Bad-use warnings:** Avoid asking “why” in a loose way when you really want a mechanism – instead frame as “How does X produce Y?” Also, be wary of mechanisms that are too **vague or anthropomorphic** (e.g. “How does the economy decide...?” – economies don’t “decide,” so rephrase in terms of forces or agents). Ensure the question is answerable with a process, not calling for a purpose or justification (mechanistic ≠ teleological).
- **Typical evidence:** **Process tracing, models, diagrams, causal chains, step-by-step explanations.** Answers often involve linking intermediate steps or components in a system, possibly supported by experiments or detailed observations.

- **Stop condition:** You have identified a credible chain of steps or components that plausibly account for how X leads to Y, and no major “black box” remains unexplained at the needed level of detail.
- **Follow-on types:** Mechanistic understanding can lead to **causal** or **predictive** questions (once you know how it works, you might ask what happens if we tweak it). It can also inspire **design** questions (knowing the mechanism, how can we intervene or replicate it?).
- **Example (weak):** “Why do we get addicted to smartphones?” – (*Asks “why” vaguely – could be interpreted as a normative or causal question; not clearly seeking a mechanism.*)
Improved (strong): “How do smartphone apps neurologically trigger reward pathways that lead to addictive use habits?” – (*Clearly focuses on the mechanism: the neurological process and reward system activation by app design.*)
Rewrite demo: The weak question was reframed from “why” (*which could invite answers about purpose or blame*) to “how” – focusing on **neurological reward pathways**. The improved question now calls for an explanatory mechanism (perhaps citing studies on dopamine release and habit formation).

4. Causal Questions

- **Function:** To **determine cause-and-effect relationships** – asking whether X causes Y, and why. These questions often take the form “Does X cause Y?” or “What is the effect of A on B?” In essence, they ask “*Why did this happen?*” in terms of causes ⁴.
- **Best contexts:** Use causal questions to **identify drivers or origins** of phenomena, especially in science, social science, history, policy evaluation. E.g. “Did policy X reduce crime rates?” or “What caused the collapse of the bridge?” or “Is there a causal link between smoking and lung cancer?”
- **Prerequisites:** Some descriptive facts about X and Y (you know X and Y occurred or vary). Often a **hypothesis or suspicion** of causation exists. It helps to have definitions and measures of X and Y pinned down (so you know what exactly you’re testing for causality).
- **Bad-use warnings:** Causal questions can **fail if they assume causation without evidence** (“Which magical thinking caused my success?”) or if they are too broad (“What causes cancer?” – too many things). Avoid **post hoc ergo propter hoc** assumptions (just because Y came after X doesn’t mean X caused Y – ensure your question is genuinely causal and not just temporal). Also, don’t embed a causal claim in a question (“Why is X the sole cause of Y?” presupposes causation; better to ask *if or how* X causes Y).
- **Typical evidence:** **Controlled experiments, statistical correlations with controls, natural experiments, longitudinal studies, historical analysis.** Good answers require evidence that can isolate X’s effect on Y (for example, randomized trial, regression analysis, or robust historical documentation distinguishing cause from coincidence) ⁵.
- **Stop condition:** You’ve reached a confident determination about causality (yes, no, or under what conditions) with supporting evidence. In practice, causality often isn’t 100% certain, but you stop when further evidence would likely not change the conclusion (e.g. multiple studies converge on the same causal inference).
- **Follow-on types:** If you find a causal link, next you might ask **mechanistic** (“how exactly does X cause Y?”). If no causal link, you might shift to **alternative causal** questions or **comparative** (what causes Y instead?). Causal findings can also inform **predictive** questions (“if we change X, will Y change in the future?”).
- **Example (weak):** “Why are people getting lung cancer nowadays?” – (*Vague and multi-faceted – “people” where? which people? “nowadays” vs before? It also blends a causal query with possibly a normative tone or blame.*)
Improved (strong): “Does long-term exposure to air pollution (PM2.5 fine particles) cause an

increased incidence of lung cancer in urban populations?" – *(Clearly causal: identifies a specific suspected cause (air pollution of a defined type) and effect (lung cancer), in a specific population, suitable for epidemiological study.)*

Rewrite demo: The vague “why are people getting lung cancer” is converted into a **testable causal question** by focusing on one candidate cause (PM2.5 exposure), specifying how to measure cause and effect, and defining the group of interest. This invites an evidence-based answer (e.g. studies comparing cancer rates with pollution exposure levels) ⁶.

5. Predictive Questions

- **Function:** To **predict future events or unknown outcomes** based on current knowledge. These ask “What will happen if...?” or “How likely is Y under scenario X?” or generally anticipate outcomes. They may also include *diagnostic predictions* (like forecasting an existing unknown, e.g. “Does this symptom mean disease X?”).
- **Best contexts:** Use predictive questions for **forecasting** in finance, policy, science (e.g. “If we increase taxes on carbon, what will happen to emissions over the next 10 years?”). In personal decisions: “What is likely to occur if I take job A versus job B?” In machine learning or stats: predicting outcomes given certain inputs.
- **Prerequisites:** Some **model or pattern** to base the prediction on (historical data, theory, or causal understanding). You typically need descriptive and causal knowledge first; prediction assumes you understand current conditions and relations enough to extrapolate.
- **Bad-use warnings:** Avoid overly **speculative or unfalsifiable predictions** (“Will I be eternally happy in life?” – not evidence-based or well-defined). Also avoid questions so open-ended they can’t be answered until it’s too late (“What will the world look like in 1000 years?” is more fantasy than actionable prediction). A predictive question should ideally be bounded in time and scope and linked to known variables (often using an if/then structure).
- **Typical evidence: Statistical or simulation models, trend extrapolations, expert judgment, forecasting methods.** Answers often come with probability estimates or confidence intervals. For example, climate models predicting temperature rise, or polling data predicting an election result.
- **Stop condition:** You have an answer in the form of a prediction or probability with a rationale or model behind it. You might stop once multiple independent methods converge on a similar forecast. (Full certainty is impossible, but a “best estimate” is reached.)
- **Follow-on types:** Predictions often lead to **decision** questions (e.g. if forecast is bad, next ask “What should we do about it?” → normative or design questions). They can also be followed by **evidential** questions later (“Did the outcome match the prediction?” for learning). If predictions are uncertain, you might backtrack to **causal** or **mechanistic** questions to improve the model.
- **Example (weak):** “What’s going to happen to the economy?” – *(Too broad and vague – which economy? What timeframe? What aspect (GDP, unemployment)? No scenario specified.)*
Improved (strong): “Given current trends and a \$1 trillion stimulus, what is the projected US GDP growth rate for next year, and what is the probability of it exceeding 5%?” – *(Specific scenario (stimulus), specific metric (GDP growth), timeframe (next year), and even asks for a probability estimate, making it a concrete forecasting question.)*
Rewrite demo: The weak question is narrowed by stating **assumptions** (e.g. including a stimulus scenario), focusing on a **quantifiable metric and timeframe**, and asking for **likelihood** (not just point prediction). This transformation makes it answerable via economic models or expert forecasts, rather than a vague guess.

6. Evaluative Questions

- **Function:** To **judge or appraise something's value, effectiveness, or quality**. These ask "How good is X?" "Was Y successful?" or "What is the merit of Z?" They often involve criteria for success or value. In short, evaluative questions are *critical assessments*.
- **Best contexts:** Use evaluative questions when a **decision or judgment** is needed – in policy ("How effective was the new policy in reducing crime?"), in product reviews ("Is this new phone model better than the previous one in terms of features and cost?"), in ethics ("Was it morally justified to do X?" overlaps with normative).
- **Prerequisites: Clear criteria or goals** to evaluate against. Often you need descriptive data about outcomes first (what happened) and perhaps comparative benchmarks. Sometimes a **normative framework** is needed if it's a moral evaluation (what standards do we use?).
- **Bad-use warnings:** Vague evaluations ("Is X good or bad?" without context) are unanswerable. Also beware of **hidden criteria** – e.g. asking "Was the project a success?" without stating how success is measured (financial return, social impact, on what timeline?). Another trap is mixing personal preference with objective criteria – keep the evaluation question focused either on objective metrics or clearly state the perspective ("good" for whom or for what purpose?).
- **Typical evidence: Performance metrics, cost-benefit analyses, expert reviews, stakeholder feedback.** For example, if evaluating a policy: data on outcomes vs targets. If evaluating a theory: logical consistency and evidence support. If evaluating a design: user satisfaction and reliability measures.
- **Stop condition:** You reach a reasoned conclusion about value or success, supported by evidence and aligned with stated criteria. Essentially, you've "scored" or rated X and can justify the evaluation.
- **Follow-on types:** Evaluative answers can lead to **recommendations** (normative: "Given it was effective, what should we do next?") or **comparative** questions (stacking up multiple options). Negative evaluations might prompt **diagnostic** questions ("Why did it fail?").
- **Example (weak):** "Is our education system any good?" – (*Unclear what "good" means here, and which aspect of the system or whose perspective. Loaded emotionally but not specific.*)
Improved (strong): "How does the high school graduation rate and student literacy level in our district compare to the national standards, and do these outcomes meet our school board's targets for success?" – (*This reframes it as an evaluative question with specific criteria: graduation rate and literacy vs. standards/targets. It also implicitly compares to a benchmark.*)
Rewrite demo: The vague "good education system?" is clarified by identifying **measurable indicators of goodness** (graduation and literacy rates), a **benchmark** (national standards), and **local targets**. Now it's answerable with data and yields a grounded evaluation (we can gather statistics to judge success).

7. Comparative Questions

- **Function:** To **compare two or more things** – identifying similarities, differences, or relative merits along certain dimensions. They often ask "Which is better, X or Y, in terms of Z?" or "How does A differ from B?" or "What are the pros and cons of X vs Y?"
- **Best contexts:** Use when you have **multiple options, theories, cases** and need to understand their relationship. In decision-making: "Which treatment has fewer side effects, Drug A or Drug B?" In history: "How did the French Revolution and American Revolution differ in causes?" In shopping: "Mac vs PC – which offers better performance for price?"

- **Prerequisites: Clearly identified alternatives** and a basis for comparison. Often you need some descriptive or evaluative info on each item first. Also, you need to decide comparison criteria (e.g. cost, effectiveness, popularity, etc.) – sometimes the question itself specifies the criteria.
- **Bad-use warnings:** Don't ask "Which is better, A or B?" *without context or criteria*. "Better" must be qualified ("better *in what sense?*"). Avoid comparing apples and oranges (make sure the comparison is fair or at least acknowledge differences in kind). Also, a common trap is a **false dichotomy** – asking to pick between two when maybe a third option exists or the comparison is oversimplified.
- **Typical evidence: Side-by-side data, comparative studies, opponent testimony, analogies.** Could be a table of pros/cons, metrics of each option, or case studies. For subjective comparisons, could involve surveys or expert opinions.
- **Stop condition:** You have a clear account of differences/similarities or a justified preference given the criteria. The comparison yields an answer like "X is better than Y on criteria 1 and 2, but worse on 3" or a conclusion if one clearly dominates.
- **Follow-on types:** Comparative results might lead to **evaluative** judgments ("So overall, which should we choose?") or **explanatory** questions ("Why are they different in this way?"). It can also feed into **design** questions (combining the best of both options).
- **Example (weak):** "Which is better, coffee or tea?" – (*No criteria given: better in taste, health, cost, what? Also subjective without context.*)
Improved (strong): "In terms of health benefits and caffeine content, how does coffee compare to tea?" – (*Specifies the aspects for comparison: health effects and caffeine levels. Now we can research those specifically and get an evidence-backed comparison.*)
Rewrite demo: The trivial "which is better" becomes a focused comparative question by adding **specific comparison metrics**. We're not asking for a personal preference but a factual comparison (e.g. antioxidant levels, caffeine mg, effects on health) which can be answered by nutritional studies.

8. Interpretive Questions

- **Function:** To **interpret meaning, significance, or underlying intent**. These questions often arise in humanities, law, or any context where **analysis of meaning** is needed: "What does X mean?" "Why is X significant?" "How should we understand Y in context Z?" Unlike causal questions, interpretive ones seek understanding of *meaning and implications* rather than mechanisms.
- **Best contexts:** Use interpretive questions for **texts, events, or data that require analysis beyond face value**. In literature: "What is the theme of this novel and how is it conveyed?" In history: "What did this treaty signify for international relations?" In law: "How should we interpret this clause of the constitution?" In data analysis: "What pattern does this trend suggest, and why might it be important?"
- **Prerequisites: Sufficient factual/contextual information** about the subject (descriptive questions usually come first – you need the "facts" before interpretation). Also, often multiple perspectives exist, so be aware of different possible interpretations (i.e. have some background or theories in mind).
- **Bad-use warnings:** Purely speculative interpretations without evidence ("I feel like it means this, but I have nothing to back it up") are weak. Avoid confusing interpretive with factual questions – asking "why did the character do X?" is interpretive (seeking meaning/motive) but make sure you base it on textual evidence rather than personal projection. Also, watch out for **leading interpretations** ("Don't you think the author intended X?") which push a viewpoint instead of asking openly.
- **Typical evidence:** In interpretive work, **textual evidence, contextual knowledge, logical reasoning**. For a novel, quotes that support a theme; for an event, accounts or documents revealing

intentions; for data, statistical patterns combined with theory. Often answers are argued rather than proved, but they should be well-supported.

- **Stop condition:** You arrive at a **coherent interpretation** that accounts for the evidence and context. In many cases, an interpretive question doesn't have a single final answer, but you stop when you have a well-justified understanding or when multiple interpretations have been considered and one is argued as most plausible.
- **Follow-on types:** An interpretation might lead to **evaluative** questions ("Was that decision justified given this interpretation?") or further **comparative** questions ("How do different scholars interpret this differently?"). It can also lead to **normative** if interpretation has moral weight ("If this law means X, should we change it?").
- **Example (weak):** "What is Hamlet *really* about?" – (*Extremely broad; invites subjective opinion without focus – Hamlet is about many things.*)
Improved (strong): "In *Hamlet*, what internal conflict is suggested by Hamlet's 'To be or not to be' soliloquy, and how does this reflect the play's broader theme of indecision?" – (*Focuses on a specific element (the famous soliloquy) and asks for interpretation of its meaning and relation to a known theme. This is answerable by analyzing text.*)
Rewrite demo: Instead of asking generally for the "meaning of Hamlet," the question zooms in on **one piece** (the soliloquy) and a **suspected theme** (indecision). This way, it guides the inquiry to produce a meaningful interpretation supported by evidence (lines from the soliloquy and how they tie to the theme).

9. Normative Questions

- **Function:** To **address what *should be*** – these are questions of value, ethics, or policy that ask "What ought we do?" or "Is X right or wrong?" or "What is the best course of action?" They often involve moral, legal, or practical standards. In essence, normative questions seek prescriptive answers (not just description) ⁷.
- **Best contexts:** Use normative questions for **decisions, ethical dilemmas, policy choices, and judgment calls**. Examples: "What should governments do about income inequality?" (policy), "Is it ethically permissible to use AI in warfare?" (ethics), "Should I invest in stock X given my financial goals?" (personal decision with value judgment).
- **Prerequisites:** A **clear understanding of the factual context** (descriptive) and often **criteria or values** relevant to the judgment. Normative questions are strongest when grounded in facts ("given what we know, what should we do?"). It also helps to clarify whose perspective or which ethical framework is being used, if relevant.
- **Bad-use warnings:** Avoid **hidden assumptions** in normative questions (e.g. "Why should we even tolerate free riders?" assumes we should *not* – it's leading). Also be careful not to mix normative with descriptive: e.g. "Should the climate be changing?" conflates an 'ought' with a natural fact. Normative questions can become meaningless if too open ("What is the meaning of life? What should one do in life?" – too broad to be actionable). Instead, break big normative issues into smaller, more specific questions with criteria.
- **Typical evidence:** **Ethical theories, cost-benefit analysis, legal principles, stakeholder opinions, projected outcomes**. While values are involved, good normative answers use evidence: for policy, data about outcomes; for moral questions, philosophical arguments or precedents. Essentially, justification is needed (*why should it be that way?*).
- **Stop condition:** You reach a **recommendation or stance** that is justified by a combination of values and facts. You stop when you have weighed the options against criteria and can confidently say "X

should be done because..." with reasoning. (In committees, this might coincide with a decision or vote.)

- **Follow-on types:** Normative conclusions often prompt **design/engineering** questions ("How do we implement that solution we think *should* happen?"). They can also lead to **comparative** (we decided what should be done; now compare options for doing it) or **evidential** (to gather support for the chosen course).
- **Example (weak):** "Should we ban social media?" – (*This is a sweeping question with no context: Ban globally? For whom? On what grounds? It's an oversimplified yes/no on a huge issue.*)
Improved (strong): "Considering the rise in misinformation and mental health concerns, should government regulators impose age limits or content oversight on social media platforms – and if so, what guiding principles should shape these policies?" – (*More nuanced: it frames the specific issues (misinformation, mental health), suggests possible actions (age limits, oversight) rather than an absolute ban, and asks for guiding principles, which acknowledges values involved. It focuses the normative debate.*)
Rewrite demo: The weak "ban or not" question is reworked to **introduce specific concerns** (justifying why we're even considering action), and **narrows the scope** to certain types of regulatory actions (age limits, content oversight) instead of a total ban. It also explicitly seeks principles (like free speech vs harm prevention) to guide the normative judgment, making the question answerable in a structured way rather than a blunt yes/no.

10. Methodological Questions

- **Function:** To **determine how to find out something or how to solve a problem** – essentially questions about the approach, method, or procedure. They ask "How should we study this?" "What method will yield the best data?" or "How can we achieve X objective given the constraints?" This is about *strategy of inquiry or action*.
- **Best contexts:** Use methodological questions in **research planning, project design, or problem-solving** when the path isn't obvious. In science: "What experimental design would test this hypothesis most rigorously?" In an investigation: "How can we gather reliable data on covert operations?" In business: "What's the best way to evaluate customer satisfaction (surveys, interviews, etc.)?"
- **Prerequisites:** A clear idea of **what you want to achieve or know** (perhaps a prior question you need to answer), and an understanding of context/constraints (resources, ethical limits, etc.). You typically need the **research question or goal defined** first, then ask the methodological question to figure out how to get there.
- **Bad-use warnings:** Avoid asking methodological questions that are too abstract ("How do we know anything at all?" – that's more philosophical unless you're specifically studying epistemology). Also, be careful not to skip this step when needed – sometimes people charge ahead without asking the methodological question and end up with the wrong approach. Conversely, don't get *stuck* in paralysis by analysis ("analysis paralysis" is a failure mode – at some point you choose a method and proceed).
- **Typical evidence:** This often involves **meta-knowledge:** drawing on **research methods literature, past case studies, expert advice, or logical reasoning about what data is needed**. The "evidence" for a method is usually arguments about its reliability, validity, efficiency, etc. For example, answering a methodological question might involve citing a textbook on experimental design or pointing to a successful example in a similar problem.
- **Stop condition:** You have a **feasible and justified plan** or method to proceed with. That means you've identified a method that is likely to provide a valid answer to your main question or achieve

the goal, and it's practical given constraints. Stop when a consensus (or your best judgment) indicates a particular method is suitable and no clearly superior alternative is evident.

- **Follow-on types:** After deciding a method, next comes actually doing it – which might involve **evidential questions** (“what data did we get?”) and then back to **descriptive/causal** analysis to interpret results. If a method is chosen but fails, that may lead to a **diagnostic** question (“why did this approach fail to get results?”) or iterative **methodological refinement**.

- **Example (weak):** “How can we know if our marketing works?” – *(A broad question that is essentially methodological, but too unspecific – what aspect of marketing? And what does “works” mean: increased sales, brand awareness, etc.? Needs clarity.)*

Improved (strong): “What research method can we use to determine whether our social media ad campaign is directly increasing sales – e.g. A/B testing with control groups or tracking referral codes – and which would provide more reliable evidence?” – *(This clearly lays out the problem (determining causal effect of ads on sales), and suggests specific methodological options (A/B test, referral tracking) asking which is more reliable. It’s answerable by analyzing pros/cons of those methods.)*

Rewrite demo: The vague question is clarified by specifying **which marketing (social media ads)** and **what outcome (increasing sales)** we care about. Then it explicitly asks for a method to establish causation (options given). We’re effectively combining a **causal question** (does the campaign cause sales?) with a **method question** (how to test it). The improved question invites an analysis of methodology – e.g. one could cite that A/B testing with a control group is the gold standard for causal inference ⁸ .

11. Evidential (Source-Critical) Questions

- **Function:** To **examine the evidence or sources** underpinning a claim. These ask “How do we know that?” “What is the evidence for X?” “Can source Y be trusted?” or “What would be credible proof of Z?” They focus on the quality, credibility, or availability of evidence.
- **Best contexts:** Use evidential questions whenever you encounter a **claim that needs verification** or when designing research (to decide what evidence to seek). In journalism: “Who are the sources confirming this story, and are they reliable?” In history: “What primary sources support this account, and how reliable are they?” In science: “What evidence would refute this hypothesis?” or “How robust are the data on climate change from satellites vs ground sensors?”
- **Prerequisites:** Typically you have a claim or question in mind already and now you’re scrutinizing evidence. So you need clarity on the claim (maybe a descriptive or causal question identified), and then you turn to evaluate evidence for it. Basic understanding of different types of evidence in the field is helpful (e.g. difference between anecdote vs systematic study).
- **Bad-use warnings:** Don’t assume evidence exists where it cannot (like asking “What’s the evidence of life after death?” might run into philosophical issues of proof). Also, avoid **cherry-picking** in your question – e.g. “Isn’t it true that study X proved Y?” (leading toward one piece of evidence); better to ask neutrally about *all* evidence. And be careful not to shift the burden of proof inappropriately (e.g. demanding impossible evidence for someone else’s claim while not questioning your own sources).
- **Typical evidence:** The answer to an evidential question will be **the evidence itself or an evaluation of it:** data, documents, witness accounts, scientific studies, etc., along with analysis of credibility (source credibility, methodology, potential bias). In historical/source-critical mode, you might assess a document’s authenticity or perspective. In science, you might weigh different studies’ findings.
- **Stop condition:** You have gathered **sufficient credible evidence** to support or refute the claim in question, or you have identified the lack of evidence (which is also informative). Essentially, you stop when you can say “We know X because of A, B, C evidence” or “We don’t know X because evidence is weak or missing in these areas.”

- **Follow-on types:** Depending on what the evidence shows, you might go back to **descriptive/causal** questions (to refine them), or move to **evaluative** (judging the claim's truth), or **diagnostic** ("why is evidence lacking?"). Also, evidential checks often feed into **crux-finding** in debates (what piece of evidence would change minds?).
- **Example (weak):** "Can we trust the news on climate change?" – (*This is too broad: "the news" where? And trust in what sense? It's a sweeping question that is hard to answer. It mixes an implicit claim about bias with a yes/no trust question.*)
Improved (strong): "What are the sources of data behind recent climate change reports (e.g. satellite data, ground measurements), and how reliable and independently verified are those sources?" – (*This asks specifically about the evidence underlying climate reports, and how reliable that evidence is. It narrows "the news" to concrete data sources and asks about verification.*)
Rewrite demo: The unfocused trust question is reframed to target **specific evidence** (satellite data, ground measurements in climate reports) and asks about their **reliability/verification**. This makes it answerable: we can discuss how satellites measure global temperatures, reference studies comparing datasets, note verification by independent teams, etc. The answer would directly address evidence quality rather than opinion about "the news".

12. Decomposition (Scoping) Questions

- **Function:** To **break a broad topic or problem into sub-questions or components**. These ask "What are the parts of X?" "What questions do we need to answer to address Y?" or "What is the scope of this problem and how can we delimit it?" Essentially, they help in **problem scoping and dividing**.
- **Best contexts:** Use decomposition questions at the **start of a complex inquiry** or when a topic feels too vague/broad. Also when forming research agendas or planning a project. For example: "What sub-questions must we answer to determine how to improve public health in this city?" or as a simpler case, "What are the main factors involved in climate change?" In personal tasks: "What steps are required to solve this engineering challenge?"
- **Prerequisites:** Recognition that the problem is **multi-faceted or ill-defined**. Some initial understanding of the general area helps so you can identify meaningful sub-parts. Often, you begin with a vague big question, then use decomposition to turn it into a set of sharper questions.
- **Bad-use warnings:** Decomposition can fail if you break things down wrongly – e.g., missing key components or splitting in a non-useful way. Avoid *overly narrow fragmentation* that loses the big picture ("analysis paralysis" by endless sub-questions). Conversely, don't stay at a high-level question when it's clearly too broad to tackle; failing to decompose is a common trap for big problems (like just asking "How do we solve world hunger?" without breaking it into regions, causes, etc.). Ensure each sub-question is indeed *answerable* and collectively they address the overall issue.
- **Typical evidence:** The "answers" to a decomposition question are **the identified sub-questions or parts**. It might come from brainstorming, consulting frameworks (like breaking a business problem into market, product, finance, etc.), or literature reviews to see how others categorize the problem. It's more about systematic thinking than external evidence, though you might use established breakdowns (e.g. a medical differential diagnosis list).
- **Stop condition:** You have a **comprehensive set of sub-questions or components** that are manageable in scope. You stop when the broad issue seems adequately covered by the pieces you've identified, and none of the pieces is too unwieldy itself (if it is, decompose further). Essentially, you feel the problem is now "well-scoped": not too broad, not missing obvious parts.
- **Follow-on types:** The sub-questions you generate likely belong to other types (some will be descriptive, some causal, etc.). So the next step is to tackle those questions in logical order.

Decomposition often leads directly into planning an **inquiry sequence** (deciding which type to address first).

- **Example (weak):** “What’s the deal with the education system?” – *(An example of a huge, vague question. It’s not decomposed at all. We don’t know where to start or what aspect.)*
- **Improved (strong):** “What are the key dimensions of our education system’s performance that we need to investigate (e.g. curriculum quality, teacher training, funding distribution, student outcomes), and what specific questions should we ask within each dimension?” – *(This explicitly asks for a breakdown: it lists some major facets of the education system and seeks sub-questions in each. It’s a meta-question guiding the scoping.)*
- **Rewrite demo:** The weak “what’s the deal” question is turned into a **scoping question** that names potential **categories** (curriculum, training, funding, outcomes) and asks for questions in each. This guides the decomposition of the broad topic into researchable chunks (like “How adequate is funding in district X vs Y?”, “How are teachers trained and does it meet needs?”, “What do student test scores indicate about outcome gaps?”, etc.). The improved format is essentially building a roadmap of inquiry.

13. Diagnostic (Crux-finding) Questions

- **Function:** To **identify the root cause of a problem or the key point of disagreement (crux)**. In problem-solving, diagnostic questions ask “What is causing this issue?” or “Which factor is failing?” In debates, crux questions ask “What key assumption or fact, if resolved, would change our stance?” The concept of a “crux” is that it’s a pivotal issue that the answer hinges on ⁹.
- **Best contexts:** Use diagnostic questions for **troubleshooting, root cause analysis**, or resolving disagreements. In medicine: “Given these symptoms, what is the most likely diagnosis and what tests differentiate between possibilities?” – a classic diagnostic. In a malfunction: “Is the failure due to a hardware issue or a software bug?” In a debate: “Are we actually disagreeing about data or about values? What experiment (or evidence) could prove one of us wrong?” (That’s a crux-finding approach as in *double crux* ⁹).
- **Prerequisites:** You have observed a **problem or conflict** and perhaps some clues. You might already have some hypotheses. For crux-finding in debates, both sides have stated positions and you suspect there’s an underlying factual question or assumption that could be tested.
- **Bad-use warnings:** Don’t stop at symptoms – a poor diagnostic question only re-describes the symptom (“Why is performance slow?” without digging into possible causes is too high-level). Instead ask “Is it slow due to CPU overload, memory leak, or network latency? How to determine which?” Also, avoid **leading to a foregone conclusion** (“This must be X, right?”) – keep an open mind to multiple causes. In disagreements, a failure mode is **avoiding the crux** and instead arguing side tangents; the solution is to deliberately *find* the crux question that would matter. Not asking diagnostic questions at all is a major pitfall (just treating symptoms or talking past each other).
- **Typical evidence: Diagnostic tests, critical observations, targeted questions or experiments.** In troubleshooting: logs, measurements isolating components. In medical: lab tests results pointing to one disease vs another. In debate: perhaps a thought experiment or data analysis that would confirm one side. The key is evidence that *differentiates* among possible causes or resolves uncertainty on the pivotal point.
- **Stop condition:** The **root cause or crux is identified**. In troubleshooting, you’ve found the component or cause that, when fixed, resolves the issue. In debate, you’ve pinpointed the claim that you actually disagree on (rather than all the superficial points) and ideally tested it or at least recognized “we differ on assumption X.” Sometimes the stop is provisional: you find the likeliest cause or a short list of likely causes that you will address in order.

- **Follow-on types:** Once the cause is known, you move to **design/engineering** (“How to fix it?”) or further **causal/mechanistic** questions to understand it better. In disagreements, once a crux is identified, the next step is **evidential** (get evidence on the crux) and then possibly revisiting **normative** implications after resolving factual disagreements.
- **Example (weak):** “Why isn’t my computer turning on?” – *(This is a straightforward problem statement, but to diagnose we need more pointed questions. As is, it’s just restating the problem as a why-question without direction.)*
Improved (strong): “Does the computer fail to turn on due to a power issue (e.g. faulty power supply or cable) or a hardware failure (e.g. motherboard)? What tests can isolate the cause – for instance, does the power LED come on, or can we hear fans or any booting sounds?” – *(This splits the problem into major possible causes and suggests specific checks (power LED, fan noise) which will differentiate between a power issue vs something internal. It’s a diagnostic strategy in question form.)*
Rewrite demo: The weak question “Why isn’t it on?” is transformed into **specific diagnostic sub-questions** targeting plausible causes (power vs hardware) and **proposes evidence to check** (LED, sounds). This guides the inquiry: if the power light is off entirely, likely a power issue; if it’s on but nothing happens, maybe motherboard. We’ve found the crux (power or not) and how to resolve it. For a debate example, a similarly structured question could be: “If we could obtain statistic X, would it make you change your mind about policy Y?” to find the crux of disagreement ⁹.

14. Design/Engineering Questions

- **Function:** To **develop solutions or create something new** – asking “How can we achieve X goal?” or “What would it take to build Y?” or “How should we design a system to do Z?” These are generative and practical, focusing on **design, invention, or action plans**.
- **Best contexts:** Use design questions whenever you move from analysis to **solution mode**. In engineering: “How can we design a bridge to span 500m with minimal materials?” In policy: “How should we structure a program to reduce homelessness?” In personal projects: “How can I organize my schedule to maximize study efficiency?” Also common in **design thinking**: often phrased as “How might we...?” which opens creative ideation ¹⁰.
- **Prerequisites:** A clear **goal or problem definition**. Often you have already answered descriptive/causal/diagnostic questions to know what needs solving. You also need to understand **constraints and criteria** for success (e.g. budget, technical limits, stakeholder needs). This often follows after understanding the problem well.
- **Bad-use warnings:** If the problem is not well understood yet, jumping to design is premature – don’t skip to “how to solve” before knowing “what’s wrong” (that’s why design comes later in sequences). Also, avoid overly general design questions like “How do we solve world hunger?” – that’s so broad it’s almost meaningless; decompose it first. Another trap: not specifying criteria, leading to solutions that “solve” the wrong problem. For example, asking “How do we increase airport security?” without criteria could lead to extreme measures that cause other issues; better to specify criteria like “without excessively delaying passengers” etc. So include constraints.
- **Typical evidence:** **Existing models, prototypes, prior art, creative brainstorming outputs, feasibility studies**. Answers might include proposed designs, plans, or algorithms. For justification, one might cite known solutions or use logical reasoning/modeling to show the design meets requirements.
- **Stop condition:** You have a **workable solution or plan** that meets the requirements. Often, you stop when you’ve drafted a design and perhaps even tested or reviewed it for feasibility. Multiple iterations might occur, but the question is “answered” when you have a solid approach ready to implement or evaluate.

- **Follow-on types:** After proposing a design, you might ask **evaluative** questions (“Is this design good/effective according to criteria?” which leads to testing or prototyping). You might also ask **comparative** questions (comparing multiple designs). Implementation leads back to **descriptive** (document what happens) and **causal** (does it have effects) inquiries. Design questions often come late in an inquiry sequence after learning from other types.
- **Example (weak):** “How do we solve traffic congestion in cities?” – (*Ambitious but vague. Which city or context? What does “solve” mean – eliminate entirely or reduce by some amount? And no mention of constraints like budget, environment, etc.*)
Improved (strong): “How might we design a city transportation plan that significantly reduces peak-hour traffic congestion by increasing public transit use, while staying within a \$500 million annual budget and meeting a 30-minute average commute time target?” – (*This gives a clear goal (reduce congestion via transit), quantifies success (commute time target, presumably shorter than current; “significantly” but also with a target metric), includes a major constraint (budget), and implies a strategy (increase transit use). It’s an actionable design question now.*)
Rewrite demo: The generic question is refined by **specifying the approach or leverage point** (boost transit use), adding **quantitative targets** (commute time), and **constraints** (budget). Phrasing it as a “How might we...” encourages creative brainstorming within those bounds ¹¹. The improved question sets the stage for designing a concrete plan (one might answer with a mix of new bus lines, subway extensions, carpool incentives, etc., justified by cost and expected impact).

Summary of Question Types: In any serious inquiry, you’ll likely use many of these question types. Descriptive and definitional questions establish the factual and conceptual groundwork ⁷. Causal and mechanistic questions drive into explanations ⁵ ⁴. Predictive questions help anticipate outcomes, while evaluative and comparative questions guide judgments and choices. Interpretive questions find meaning beyond raw facts, and normative questions incorporate our values and goals into what *should* be done ⁷. Methodological and evidential questions ensure our process is sound and our information is trustworthy. Decomposition questions help manage complexity, and diagnostic/crux questions target the heart of problems. Finally, design questions move us from understanding into action. By clearly identifying which type of question you’re asking, you clarify what kind of answer you need and avoid common pitfalls of muddled inquiry.

Question Quality Index (Rubric for Good Questions)

Not all questions are created equal – some are far more effective than others. A **Question Quality Index** helps evaluate and even score questions on various dimensions of quality. Below are key criteria for what makes a question “good” in investigative terms. Use these as a rubric to critique and improve questions:

- **Clarity:** Is the question clearly worded and unambiguous? Good questions define or avoid vague terms. All key terms should be understood in one way. (E.g. “What is the effect of social media on youth?” is unclear – what effect? which youth? – whereas a clarified version defines effect and demographic precisely.)
- **Scope (Focus):** Is the scope appropriately narrow and focused? A good question is **specific enough** to be answerable, but not so narrow that it’s trivial. It should have clear boundaries (topic, time frame, population, etc.). Overly broad questions usually rate low on this.
- **Answerability (Evidence Exists):** Can the question be answered with available or conceivable **evidence or reasoning**? A high-quality question points toward observable facts or logical analysis

that could answer it. If a question asks for something fundamentally unknowable or currently unobservable, it's low quality in practical terms.

- **Claim-Type Alignment:** Does the question stick to one **type of inquiry** at a time (descriptive vs causal vs normative, etc.)? Mixed questions are confusing and score poorly. A good question aligns with a single functional type, which ensures the kind of answer it's looking for is coherent (fact, explanation, value judgment, etc.).
- **Falsifiability / Open-Endedness:** (for questions that imply hypotheses) Is the question formulated such that it **could be disproven or surprised by evidence**? This is akin to a hypothesis being falsifiable ¹². For example, "Is X causing Y or not?" is better than "Why is X obviously causing Y?" which assumes an answer. Good questions are *open* to different answers and invite genuine discovery.
- **Evidential Alignment:** Does the question **align with available evidence and methods**? A quality question matches the state of knowledge – e.g., asking for a randomized trial evidence in a context where that can be done. If evidence needed would be unethical or impossible to gather, the question might need reframing.
- **Decision-Relevance:** (if applicable) If the question is meant to inform a decision, does it **connect to a decision criterion**? Essentially, will the answer be useful for choosing or acting? This is crucial in policy or personal decision contexts – a question scores higher if its answer clearly guides what to do next. (For instance, "What are the pros and cons of option A vs B given our goal?" is directly decision-relevant; asking something irrelevant wouldn't help the decision.)
- **Bias and Neutrality:** Is the question **free of loaded language or biasing assumptions**? A good question doesn't "push" the answer subtly. It should be neutral in wording (unless intentionally taking a stance to probe a viewpoint, but even then clarity about that is needed). Avoid emotionally charged or leading phrasing.
- **Novelty & Depth:** Does the question promise **new insight or deeper understanding** rather than surface-level info? High-quality questions often hit at gaps in knowledge or unresolved debates (high expected information gain ¹³). A trivial question ("what's 2+2?") is clear and answerable but not high-value because it yields nothing new. So consider the potential information gain or learning from the question.

Each of these criteria can be used to **score** a question (e.g., 1-5 scale) if needed. For example, a question like "When will the world end?" would score poorly on clarity (vague "world end"), answerability (no evidence available), and scope, whereas a question like "What is the projected population of India in 2030 according to UN data?" scores high on clarity, scope, answerability (it's specific and we have data/projections), though it might be lower on novelty (if projections already exist).

Practically, use the rubric to **debug and refine** questions. If a question scores low on one dimension, adjust it – narrow the scope, clarify terms, neutralize the language, etc. The goal is to craft questions that are clear, focused, evidence-seeking, and purposeful. "*Strong research questions serve as the foundation of a sound inquiry*" ¹⁴ – applying these quality checks helps ensure your questions meet that standard.

Question Debugger: A Checklist for Flawed Questions

Even seasoned thinkers fall into common traps that make questions faulty. Use this **Question Debugger** checklist to spot and fix typical failure modes in questions:

- **Multiple questions mixed in one:** Does the question actually contain several questions tangled together? (E.g. *“Is the new policy effective and is it fair?”* mixes an evaluative and a normative question.) If yes, split it into atomic questions.
- **Undefined or ambiguous terms:** Are there any key words that are vague or could be interpreted in different ways? (*“successful outcome”, “young people”, “better”*). If yes, clarify or define them (possibly ask a definitional question first).
- **Hidden normative bias:** Does the question sneak in a value judgment or assumption of “good/bad” without stating criteria? (*“Why is this project a failure?”* assumes it is a failure.) If yes, rephrase neutrally or explicitly ask a normative question with criteria.
- **Assumed causation (without evidence):** Does the question presuppose a causal relationship or explanation? (*“How did X cause Y?”* presumes X did cause Y.) If this is not established, back up – first ask if X caused Y. Avoid building answers into the question.
- **Loaded or leading language:** Does the phrasing push toward a particular answer or contain emotionally charged terms? (*“How terrible was the impact of the policy?”* leads the witness.) If yes, neutralize the language (*“What was the impact of the policy?”*).
- **Unbounded scope:** Is the question so broad that it doesn’t set useful limits? (*“What should we do about global inequality?”* – enormous topic.) If yes, apply scope limits (who is “we”? which aspect of inequality? short-term or long-term?). Possibly use decomposition to break it down.
- **No clear answer criteria:** If someone tried to answer, would it be unclear when the answer is sufficient? (Some “why” questions suffer this – when have you explained “why” enough?) If yes, add specifics: e.g. ask for “primary reasons” or “evidence for X, Y, Z”.
- **Unanswerable framing:** Does the question ask for something fundamentally unknowable or unfalsifiable? (*“What would have happened if dinosaurs never went extinct?”* can be fun, but there’s no definitive evidence.) For serious inquiry, reframe to something evidence-based or clearly hypothetical with rationale.
- **Category error:** Does the question ask something that doesn’t conceptually make sense? (*“What color is the taste of chocolate?”* mixes categories – taste isn’t measured in colors ¹⁵.) If yes, re-express in a meaningful way or drop it.
- **Missing context or perspective:** Is it clear *who* or *what context* the question refers to? (*“Is it legal to do X?”* – where? under which jurisdiction?) If not, add context (location, timeframe, perspective).
- **Premature question:** Are you asking a high-level or downstream question before fundamental ones? (*Jumping to “How do we fix it?”* before knowing what’s broken.) If yes, identify prerequisite questions (use a sequence) and tackle those first.
- **Absence of evidence check:** If the question is based on a claim, has the evidence for that claim been questioned? (*“How can we improve X since it’s failing?”* – did we verify X is indeed failing?) If not, include an evidential question to confirm the premise.

Use this checklist as you formulate or review questions. Whenever a question feels “off” or someone is struggling to answer it, run through the debugger: you’ll often find one of these issues at play. Then apply the prescribed “fix” – break it up, define terms, remove bias, adjust scope, or reorder the sequence. By debugging your questions, you remove obstacles that could derail the inquiry before it even begins.

(Think of this like test-driving your question – if it has a flat tire or the engine won't start, this checklist helps you find out why and fix it, so your inquiry can get moving.)

Common Inquiry Sequences (Playbooks for Asking the Right Next Question)

Rarely does one question, asked in isolation, solve a complex inquiry. More often, we need a **sequence of questions** – each type of question playing a role – to progressively reach understanding or a decision. Below are some **common inquiry sequences** or “playbooks” that show how different question types can be ordered to achieve typical goals. These are like templates you can adapt to your situation.

Each sequence is named (S1, S2, etc.) and broken down into steps with the question type at each step. Think of it as a logical flow; at each stage, once you get an answer, it cues the next type of question.

S1 – Learning a Contested Topic Fairly

Goal: Gain a balanced understanding of a controversial or debated topic without falling into one-sided bias.

1. **Definitional:** Start by clarifying terms and claims. *“What exactly is being debated? How is each side defining the key terms?”* For example, in debating climate change policy, define what “carbon neutral” means or what policies encompass “Green New Deal.” This ensures you aren't mixing up interpretations.
2. **Descriptive:** Gather the basic facts. *“What do we know about the current situation?” “What has happened so far?”* This could include historical background or statistics. In the climate example: current CO₂ levels, temperature trends, past policy actions ¹⁶.
3. **Evidential:** Ask for evidence from all sides. *“What evidence is presented for each claim or viewpoint? How credible is it?”* Check sources for each side's arguments ¹. E.g. one side might cite economic data, another cites environmental studies – examine both.
4. **Comparative:** Juxtapose the different perspectives or hypotheses. *“How do the arguments differ, and on what points (facts, values) do they directly conflict?” “What are the pros/cons or strengths/weaknesses of each position when examined side by side?”* This helps avoid straw-manning any side; you're actively comparing the steelmanned versions of each.
5. **Crux-finding (Diagnostic):** Identify the key disagreements. *“What question, if answered, would really distinguish which view is more correct?”* For instance, the crux might be “Does policy X actually reduce emissions without harming jobs?” – a point both sides argue about. Formulate that question.
6. **Investigative (could be Causal/Predictive/Evidential depending on crux):** Now focus on that crux question and answer it with evidence. Perhaps it's causal: “Did policy X cause emissions to drop?” or predictive: “Would implementing X cause economic downturn?” Seek out studies or data to resolve this.
7. **Synthesis:** Finally, integrate what you've learned. *“Given the evidence and definitions, what's a fair conclusion or summary of the topic?”* Perhaps the answer is nuanced: e.g. “Policy X reduced emissions moderately and had a small short-term job impact, but long-term effects are unclear.” Acknowledge what remains uncertain.

This sequence ensures you don't jump straight to arguing conclusions. You clarify the debate, look at facts, compare sides evenly, and zero in on the pivotal issues (**like performing a “Double Crux” analysis to find**

the decisive question ⁹). It's a way to learn contested topics in good faith, updating your view as evidence dictates.

S2 – Evaluating a Conspiracy Claim

Goal: Critically examine a claim that might be a conspiracy theory or otherwise suspect, and distinguish fact from fiction.

1. **Definitional:** Define what the claim actually is. Conspiracy claims often are vaguely stated. *“What exactly is being claimed happened? Who are supposedly involved, and what would ‘real’ mean in this context versus ‘hoax’ or ‘moral panic’?”* For example, claim: “Event Y was orchestrated by a secret group.” Define “orchestrated” – does it mean fully fabricated evidence or just opportunistically reinterpreted events?
2. **Evidential:** Ask, *“What evidence is offered for this claim?”* List the pieces of evidence (documents, testimonies, anomalies, etc.). Then scrutinize each: **source-critical** questions – *“Where does this evidence come from? Is it authenticated or could it be fake/misinterpreted?”* Often conspiracies rely on anecdotal or dubious evidence, so this step is crucial ¹⁷ .
3. **Alternative explanations:** Use **comparative/causal** questions to consider non-conspiracy explanations. *“What are the more ordinary explanations for the same evidence?”* E.g. *“Could this be a case of moral panic or error rather than an actual conspiracy?”* ¹⁸ . Essentially, test the conspiracy hypothesis against the null hypothesis or mainstream view.
4. **Causal/Investigative:** If possible, ask causal questions to test the claim: *“If group X did this, what observable consequences should we see? Do we see those? Conversely, if it was a panic/mistake, what would we see?”* This frames the claim in testable terms. For instance, *“If it were a widespread Satanic cult conspiracy, we’d expect cross-verified physical evidence of rituals, multiple independent investigations finding perpetrators* ¹⁸ . *Do we have that? Or do we only have accusations and no corroboration?”*
5. **Admissibility of evidence:** Sometimes, ask, *“What evidence would we accept as proof, and has that standard been met?”* Conspiracy debates can devolve into dismissing all counter-evidence as “fake”; set a standard for what *would* convince a neutral observer. If that evidence is absent, that’s telling.
6. **Decision threshold:** Normative question in a sense: *“Given what we’ve found, should we treat the conspiracy claim as credible or not? What’s the threshold of evidence required, and has it been met?”* This leads to a conclusion: either *“there’s enough smoke that further investigation is warranted”* or *“this is likely baseless.”*
7. **Next steps:** Design question if needed: *“How should we investigate further, if at all?”* or simply provide a conclusion: e.g. *“The evidence overwhelmingly points to a **moral panic** rather than a real conspiracy, as 12,000 allegations yielded no concrete proof* ¹⁸ .”

This sequence helps maintain a skeptical but open-minded stance. By defining the claim clearly, examining evidence quality, and considering alternative explanations, you guard against both gullibility and dismissiveness. It’s essentially critical thinking applied to extraordinary claims (which, as Sagan said, require extraordinary evidence).

(Real-world example: the 1980s Satanic Panic in the U.S., where people believed in a conspiracy of ritual Satanic abuse. A structured inquiry revealed it as a moral panic with “over 12,000 unsubstantiated cases” and no organized cult behind it ¹⁸ . *The sequence above would lead you to that conclusion by checking evidence and finding none solid.)*

S3 – Making a Policy or Personal Decision

Goal: Arrive at a well-reasoned decision when faced with a complex choice (could be public policy or a personal plan), through systematic questioning.

1. **Goal/Criteria Definition (Normative):** Start by asking, “*What is the actual goal we seek, and what criteria define success?*” For personal decisions: “What do I value or want to achieve?” For policy: “What outcomes are we aiming for (economic growth, equality, etc.)?” This clarifies *what should drive the decision*.¹⁹ (Often using FINER or similar criteria – feasible, ethical, etc., if it’s a research question scenario¹⁹).
2. **Constraints Identification (Descriptive):** “*What are the constraints and realities we must consider?*” e.g. budget limits, time frame, legal constraints, personal circumstances. Essentially, a descriptive mapping of the decision context (resources, limitations).
3. **Options Generation (Design):** “*What are the possible options or actions we can take to reach the goal?*” If not already given, use creative **design questions** to generate solutions or choices. E.g. if the goal is reduce traffic, options might be “build more roads, improve public transit, congestion pricing, encourage remote work, etc.”
4. **Causal/Predictive:** For each option, ask “*What do we expect will happen if we do this?*” Use predictive questions to forecast outcomes of each option⁴. This could involve research or models (e.g. “If we implement congestion pricing, what drop in traffic can we expect? If I take job A, what career trajectory might I have?”). Also consider side-effects (causal thinking: “might option X cause any unintended consequences?”).
5. **Comparative Evaluative:** Compare the options against the criteria. “*How does Option A stack up against Option B in terms of our success criteria and risks?*” This is a multi-criteria evaluation, possibly requiring a table of pros/cons or scoring. It often combines **comparative** and **evaluative** questioning.
6. **Decision (Normative):** Finally, “*Given the evidence and comparisons, which option should we choose, and why?*” This is the actual choice, justified by the previous analysis. It’s normative because you’re prescribing an action (“We should do X” or “I will choose Y”), supported by the predictive and evaluative work. If none of the options meet criteria, you might loop back to design and come up with new options.
7. **Implementation Plan (Design):** If needed, follow up with a design question: “How do we implement the chosen option effectively?” – beyond the decision itself, ensure it can be executed well.

This sequence is essentially the structure of rational decision-making and policy analysis. It ensures clarity of objectives, explicit consideration of alternatives, evidence-based forecasting, and transparent trade-offs. By the end, you have not just a decision but a documented rationale. (It mirrors formal methods like Decision Analysis or the Policy Analysis Process.)

S4 – Building a Scientific Explanation (Inquiry in Science or Investigative Analysis)

Goal: Develop a sound explanation for an observed phenomenon through a structured questioning process (akin to scientific method or investigative logic).

1. **Observation and Description:** “*What exactly is happening or was observed?*” Start with descriptive questions to pin down the phenomenon. E.g. “The machine is outputting errors under conditions A and B. What are the patterns? When did it start? How often?” In science: “We observe that species X disappeared from area Y. What are the details of that change?” Establish clear facts.

2. **Potential Hypotheses (Exploratory/Mechanistic):** *“What might explain this? What are possible mechanisms or causes?”* Brainstorm multiple explanations. This is asking *“How could this happen?”* in plural. List candidate causes or processes (without committing yet). For each, maybe a quick sub-question: *“Could it be due to Z? What would that entail?”*
3. **Definitional/Clarification of Hypothesis:** Take one hypothesis at a time and refine it. *“What exactly do we mean by this hypothesis and what would it predict?”* Ensure each hypothesis is clearly stated (no vague guesses). This often involves definitional and mechanistic sub-questions: e.g. *“If hypothesis is ‘virus killed species X’, define the timeline and mechanism – how would the virus spread, and what symptoms appear?”*
4. **Causal Testing Questions:** For each hypothesis, ask **causal/predictive** questions: *“If this is the true cause, what evidence should we see? How can we test it?”* Formulate experiments or observations. E.g. *“If it’s a virus, we should find traces of the virus in tissue samples of species X. Is that present?”* – an evidential question. Or *“Does introducing the virus to healthy individuals cause illness?”* – a causal experiment question (if ethical/possible).
5. **Gather Evidence (Evidential):** Now actually gather or recall the evidence for each hypothesis. Sometimes this is doing an experiment; other times it’s looking at existing data. Essentially, answer the questions posed in step 4. This often becomes iterative: test one hypothesis, see results, rule it out or keep it.
6. **Comparative Analysis:** Compare how well each hypothesis fits the evidence. *“Which explanation is best supported by the data? Which can be ruled out?”* This might involve a **diagnostic question**: *“Is factor A or factor B more likely causing the effect?”* and looking at evidence to decide.
7. **Refine or Conclude (Mechanistic Explanation):** Formulate the final explanation: *“What is the most likely explanation and how does it work in detail?”* This is a synthesis, essentially answering the original *“why/how”* with a supported mechanism. If needed, loop back – sometimes evidence yields new clues and you iterate (the sequence can cycle until a satisfactory explanation emerges).
8. **Counterexamples and Boundaries:** A good explanation also asks, *“Are there cases where this explanation might not hold? What are the limits or counterexamples?”* This is an **interpretive/evaluative** aspect – understanding scope. E.g. *“This mechanism explains the decline in area Y, but in area Z something else happened – why the difference?”* That might spawn a new mini-inquiry.

This sequence mirrors how scientists approach a question: observe, hypothesize, predict, test, refine ⁵. It ensures you don’t latch onto one explanation prematurely (because you explicitly consider alternatives) and that you design questions to test them. By the end, you have an explanation with evidence behind it, and you understand its limitations.

These sequences are not the only ones – think of them as exemplars. In practice, you can craft a sequence tailored to your need. The key is **ordering questions in a logical flow**, where the answer to one informs the next. You might find you need to loop or revisit earlier steps as new info comes in – that’s normal. But having a game plan (even if it’s a flexible one) helps prevent asking random questions in circles. Instead, you have a strategic approach to drive inquiry forward, like a detective following leads in a thoughtful order.

Quick Reference: Choosing the Next Question Type

When you're in the middle of an inquiry and wondering "What question should I ask next?", use this quick cheat-sheet. It matches common situations with the question type that can productively move things along:

- **If you have a broad topic and don't know where to start:** Use a **Decomposition question** – ask "What are the key parts or sub-questions here?" This will break the ice and give you a map of smaller questions to tackle.
- **If discussions are getting confused due to terminology:** Insert a **Definitional question** – "What do we mean by X exactly?" – to clarify terms. Often, resolving definition gaps resolves disagreements.
- **If everyone agrees on facts but is arguing opinions or "shoulds":** It's time for a **Normative question** – "Given these facts, what should we do or what's the right thing?" This shifts to discussing values and criteria openly.
- **If you have facts but not understanding:** Ask a **Mechanistic or Causal question** – "How does this actually work?" or "Why is this happening (in terms of cause)?" – to dig deeper into explanations.
- **If you suspect an assumption is wrong or something feels off:** Use a **Diagnostic (Crux-finding) question** – "What's the key assumption here and can we test it?" – or "What would show if we're on the wrong track?" This can save you from following a false lead.
- **If you're overwhelmed by conflicting evidence:** Pivot to an **Evidential question** – "Which evidence is most reliable or relevant? How do these sources compare?" Focus on quality of evidence; that often clarifies which narrative holds up.
- **If a question is too hard or abstract as stated:** Try a **Scoping question** – "Can we narrow this down? Perhaps focus on a smaller timeframe/population/aspect where we can get traction." Or break the question into parts (decompose).
- **If nothing seems answerable with current knowledge:** Ask a **Methodological question** – "How could we find this out? What method or research approach would get at this?" This might point you to gather more data or consult an expert.
- **If you have a lot of data but no conclusion:** Consider an **Interpretive question** – "What does all this data mean? What pattern or story emerges?" This helps synthesize information into insight.
- **When nearing a decision but stuck between options:** Formulate a **Comparative question** – "Side by side, what are the differences or trade-offs between these options?" This structured comparison can illuminate a choice.
- **If group debate is circular or heated:** Bring focus with a **Crux question** – "What specific point do we actually disagree on? And what evidence would resolve that?" It can break a stalemate by refocusing on a testable claim ⁹.
- **Before finalizing an answer:** It can be useful to ask a **Devil's Advocate question** (which can be mix of evaluative/diagnostic) – "What could be wrong with our conclusion? Did we consider an alternative?" This can be the difference between a decent answer and a robust one.

Think of these as prompts. The idea is that at any stage of inquiry, there's usually a *logical next question type* that will drive progress. If you feel stuck, identify your situation from the above and try that kind of question. It keeps the inquiry flowing and ensures you're using the right tool for each job.

(For example, suppose you have a research finding that two variables are correlated. Instead of immediately asking "How do we act on this?", the next logical question might be causal: "Does one actually cause the other or are they just correlated?" That's the right question before any decision or action.)

Case Study: Transforming a Vague Inquiry into a Disciplined Question Sequence

Let's apply the frameworks above to a concrete example, step by step. Consider a real-world vague question:

Raw Question: "Was the Satanic Panic real or just a moral hysteria?" (*This refers to the 1980s wave of fear about alleged Satanic ritual abuse.*)

At first glance, this question is mixing things: it's asking for a *factual/historical judgment* ("real or not") but also has loaded terms ("moral hysteria") and is somewhat binary. We'll use our tools to dissect and improve it.

1. **Classification & Issue:** The raw question is essentially a **Comparative/Evidential** question (real conspiracy vs. moral panic) with a hint of **evaluative** ("just hysteria?" implies a judgment). It also suffers from loaded language and ambiguity (what does "real" entail exactly?). So, first step: debug it.
2. It mixes normative tone ("just a hysteria" has a dismissive connotation) with descriptive (asking what it *was* in reality).
3. Undefined term: "real" – real *what?* A real conspiracy? A real phenomenon?
4. No clear criteria for "real" vs "hysteria."
5. It's a broad historical question; evidence might be complex.
6. **Decomposition:** Break it into sub-questions:
 7. **Definitional:** "What do we mean by 'Satanic Panic' and 'real conspiracy' in this context?" We need to define what it would mean for it to be "real." Possibly: a coordinated network of satanic cults abusing children (as claimed) versus a baseless panic (mass fear with no actual cult behind it).
 8. **Descriptive (History):** "What actually happened during the Satanic Panic (timeline, key cases, allegations)?" Gather the facts: number of cases, investigations, outcomes.
 9. **Evidential:** "What evidence was found (or not found) of organized Satanic ritual abuse?" We expect to see if any credible proof came up (bodies, physical evidence, confessions beyond coerced ones, etc.).
 10. **Comparative:** "How does the pattern of the Satanic Panic compare to known 'moral panics' in history (features like lack of evidence, media frenzy, public fear)?" Also compare to real conspiracies uncovered (what's different?). This sets criteria: real conspiracies (like a proven criminal ring) usually have hard evidence and convictions; moral panics usually have lots of smoke, no fire.
 11. **Diagnostic/Crux:** "What is the critical piece of evidence or lack thereof that would determine if this was real or not?" Perhaps: the existence of any *substantiated* case of Satanic ritual abuse. A single confirmed cult case might suggest something real; zero despite many allegations suggests hysteria.
 12. **Normative (if needed):** Not really needed to answer the factual question, but maybe: "What should society learn or do to avoid such panics?" could be a follow-up.
13. **Answering in Sequence:**

14. **Defining terms:** We establish that “Satanic Panic” refers to the widespread fear (mostly in the US in the 1980s) that Satanic cults were abusing children, and by “real” we mean actual, organized ritual abuse conspiracies existed; “moral panic” means a socially spread fear with no basis in reality ²⁰ . Now the question is clearer: *Was there an actual conspiracy of Satanists abusing kids, or was it an unfounded wave of fear?*
15. **Descriptive facts:** Research shows the panic involved over 12,000 accusations across the country, several high-profile trials (e.g., the McMartin preschool trial), extensive media coverage, and many children interviewed under suggestive techniques ¹⁸ . It lasted roughly from early 1980s to early 90s.
16. **Evidence check:** We ask what evidence was found. Historical review: *No physical evidence of Satanic ritual murders or underground networks was ever confirmed; cases relied on testimony (often from young children under coercive questioning) and recovered memories, which later proved unreliable. Many charges were dropped or overturned; no canonical “Satanic cult” kingpins were revealed.* ¹⁸ This strongly indicates lack of real conspiracy. (We cite, for instance, that *the FBI’s own investigation found no substantiation of the claims.*)
17. **Comparative analysis:** Patterns match a *moral panic*: the claims were extraordinary but evidence absent, fueled by media and social anxiety, akin to historical witch hunts. By contrast, known conspiracies (like organized crime rings) usually leave a trail (money, communication, etc.). Here, nothing tangible was found despite massive investigations – a hallmark of a panic.
18. **Key crux evidence:** Was **any** actual Satanic cult ever uncovered through these cases? Answer: *No – there were individual occult practitioners here and there, but no evidence of the massive coordinated abuse rings described.* If even a fraction of the allegations were real, there should have been corroborative evidence (bodies, photos, financial trails of trafficking, etc.), but there were none. That’s the crux: the absence of evidence despite huge investigations ¹⁸ .
19. **Conclusion (Synthesis):** Therefore, we conclude: **The Satanic Panic was a moral panic, not a real conspiracy.** As one source summarized, *it consisted of thousands of unsubstantiated cases of alleged ritual abuse with no factual basis* ¹⁸ . The question is answered with a high degree of confidence on the “just hysteria” side, backed by the investigative record.
20. **Reflection:** Using the frameworks, we turned a somewhat inflammatory question into a series of sober inquiries. We defined criteria for “real vs. hysteria,” examined evidence, and essentially performed a historical diagnosis. This approach avoided a purely emotional or opinion-based answer and grounded the conclusion in documented evidence (or lack thereof). We also implicitly addressed *why* the panic happened – not asked explicitly above, but one could add: **Interpretive** question, “What underlying fears or social factors fueled this panic?” to learn lessons. (Sociologists have answered: it tapped into fears about childcare, changing family structures, etc., which is outside our scope but an interesting follow-on).

Case Study Summary: The vague question was resolved by systematically applying: - Definitional clarity (what do we mean by real?), - Evidential scrutiny (what proof? none found), - Comparative pattern matching (it fits known panic patterns), - and thus Diagnostic conclusion (lack of evidence is diagnostic of a false claim).

This showcases how the “Question Atlas” and tools can be used in tandem to dissect a complex issue. It’s like doing detective work with a structured approach: clarify the mystery, gather clues, rule out suspects, and then close the case with a reasoned verdict.

(You could similarly analyze other examples: e.g., “Do microtransactions in video games exploit players?” – define exploitation, gather data on player spending and psychology ¹⁷, compare to ethical standards, etc., leading to a nuanced answer. Or a policy question like “Did Policy X cause outcome Y?” – break into data analysis, counterfactual reasoning, etc. The method scales to various domains.)

Conclusion

Better inquiry starts with better questions. This field manual has introduced a comprehensive framework – a **Question Atlas** of functional types, guidelines for when and how to use each, transformation techniques to rescue bad questions, a quality rubric, debugging checklist, and sample sequences to navigate complex inquiries. The key takeaway is that asking questions is not just a spontaneous act but a skill that can be engineered and improved.

By consciously choosing the *type* of question that fits your need (and knowing its “job” and pitfalls), you direct your mind – and others’ – to the right kind of answer. By iterating through sequences of questions, you tackle problems methodically, like climbing a ladder one well-placed rung at a time instead of leaping in the dark. And by evaluating and refining your questions (using the rubric and debugger), you sharpen them into effective tools that cut through ignorance and confusion.

In science, philosophy, journalism, or everyday life decisions, this approach turns nebulous curiosity into **high-yield inquiry**. As the saying (attributed to Voltaire) goes, “*Judge a man by his questions rather than his answers.*” Now equipped with this manual, you have a way to judge, improve – and ultimately ask – questions that lead to clarity, truth, and wise action.

Remember: Every great discovery or solution begins with a great question. So, whenever you face the unknown, don’t just ask questions – **engineer** them. Your future answers will thank you.

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