PIXELMAGIC STUDIOS™ / METHODOLOGY 01

THE ARCHITECTURE OF INQUIRY

The PixelMagic Research Method

A documented process for developing questions, constructing models, testing explanations, communicating uncertainty, and deciding what is ready to share.

Document type: Studio methods statement. This paper describes a research workflow and publication standards; it is not an experimental study, a peer-reviewed validation, or evidence that any particular PixelMagic hypothesis is correct.

Scope: Conceptual models, geometry, human systems, civic research, educational writing, and interdisciplinary inquiry. Domain-specific claims require domain-specific expertise, evidence, and review.

Core commitment: An appealing explanation is a starting point for investigation, not proof.

The guiding question

What would we need to observe, measure, or discover to show that this model is wrong?

This question guides the move from intuition to an accountable research claim. A model remains provisional when the evidence is incomplete.

01 / Begin with an observation, not a conclusion

Record what prompted the question: a visual pattern, reported event, dataset, scientific result, or conceptual inconsistency. Preserve the original observation separately from the explanation proposed for it.

- **Observation:** What was actually seen, measured, reported, or documented?
- **Interpretation:** What might the observation mean?
- **Hypothesis:** What specific explanation could be tested?
- **Open question:** What remains unknown?

02 / Reconstruct the system

Describe the system before explaining it. Identify components, geometry, boundaries, scales, inputs, outputs, constraints, interactions, and changes over time. Where useful, sketch the structure before introducing equations or causal claims.

For a geometric question, distinguish the diagram from the physical object: a drawing can illustrate a possibility without demonstrating that nature behaves that way.

03 / Build competing explanations

Write the primary hypothesis alongside at least one credible alternative, including a simpler explanation when available. List the assumptions each requires. Seek disconfirming observations as actively as confirming ones.

- What observations would each hypothesis predict?
- Which observations would distinguish the hypotheses?
- What confounders, selection effects, or missing measurements could mislead us?

04 / Establish an evidence trail

Prioritize primary records, reproducible datasets, authoritative technical documentation, and peer-reviewed research where appropriate. Record publication dates, definitions, source limitations, and how claims were derived. A citation supports only the statement it actually establishes.

- Keep calculations and transformation steps inspectable.
- Label firsthand observations and anecdotal signals as such.
- For current events, date-stamp claims and revisit changing records.

05 / Challenge and revise

Stress-test a model against edge cases, alternative explanations, contrary findings, and expert critique. Identify what would falsify or substantially weaken the claim. Revise or retire models when new evidence conflicts with them.

- **Supported:** Evidence currently supports a specific bounded claim.
- **Provisional:** Plausible explanation; material uncertainties remain.
- **Speculative:** Conceptual possibility without adequate empirical support.
- **Not established:** Evidence does not justify the proposed conclusion.

06 / Use AI as a research aid, not an authority

AI can help formulate questions, compare hypotheses, organize notes, draft diagrams, identify possible confounders, and improve clarity. Its outputs can be wrong, fabricated, incomplete, or overly confident. The human researcher remains responsible for verification, editorial judgment, authorship decisions, and release approval.

- Check consequential factual statements against accessible original sources.
- Treat AI-generated references, calculations, quotations, and summaries as unverified until checked.
- Document AI assistance when it materially contributes to the published work.
- Disagreement and revision are normal parts of the process; persuasive wording is not evidence.

07 / Separate scientific and public editions

Technical edition: Define terms, methods, data, assumptions, citations, counterevidence, limitations, falsification conditions, and revision history.

Public edition: Explain the same bounded conclusions in accessible language, using examples and visuals. Simplification must not turn uncertainty into certainty.

Neither edition should claim validation solely because the other exists.

08 / Publication and intellectual-property gate

A model progresses through **Private / Draft** → **Under Review** → **Approved for Public Release** → **Published**. A website listing, polished illustration, or PDF export does not constitute scientific verification.

- Confirm the public release is explicitly approved by the creator.
- Remove private notes, mechanisms, unpublished figures, hidden files, and sensitive metadata.
- Check citations, rights, dates, attribution, limitations, and factual claims.
- Provide a version number and correction path; preserve prior revisions privately.
- Avoid presenting exploratory claims as consensus science or peer-reviewed findings.

A repeatable model record

Required fields: Title / ID; question; observation; scope; hypothesis; alternatives; methods and sources; assumptions; evidence for and against; confounders; predictions or falsification criteria; limitations; status; revision date; attribution; release approval.

For research that cannot yet be tested, the record should explicitly say so and remain a conceptual exploration.

Limitations of this methods statement

This document records a proposed studio workflow. It does not independently audit past projects, guarantee research quality, certify reproducibility, establish novel discoveries, or replace peer review or domain-specialist assessment. Method quality must be demonstrated in the execution of each project.

Selected methodological context

Popper, K. (1959). *The Logic of Scientific Discovery.* Hutchinson.

Nosek, B. A., et al. (2015). Promoting an open research culture. *Science, 348*(6242), 1422–1425. DOI: 10.1126/science.aab2374.

Wilkinson, M. D., et al. (2016). The FAIR Guiding Principles for scientific data management and stewardship. *Scientific Data, 3*, 160018. DOI: 10.1038/sdata.2016.18.

National Institute of Standards and Technology (2023). *Artificial Intelligence Risk Management Framework (AI RMF 1.0).* NIST AI 100-1. DOI: 10.6028/NIST.AI.100-1.

These sources provide methodological context; this paper does not claim formal compliance or independent certification.