A NISHAN FIELD GUIDE

The Researcher’s Handbook

A field guide to asking good questions, and answering them honestly — from your first idea to the moment you put your work in front of other people.

Most people think research begins with an answer — a finding, a number, a headline. It doesn’t. Research begins with a question specific enough to be wrong about, and it ends, if you do it honestly, with a small, defensible piece of the truth added to what everyone else already knows.

Everything in between — the reading, the designing, the data, the doubt — is the actual craft. This guide is our attempt to walk you through that craft, one honest step at a time.

Why bother learning to do this well

Almost nobody sets out to do bad research. They set out to confirm what they already suspected, on a timeline that was too short, with a sample that was too convenient — and the research comes out bad as a side effect. The methods in this guide exist because good intentions aren't enough. You need a process that catches your own mistakes before your reader does.

That process is learnable. It doesn't require a lab, a grant, or a professor standing over your shoulder — it requires knowing what question you're actually asking, what a defensible answer looks like, and where the gap between the two usually opens up.

WHAT GOOD RESEARCH HABITS ACTUALLY GET YOU

- **Findings that survive scrutiny.** A result someone else can poke at, replicate, and still believe.
- **A sharper eye for other people's claims.** Once you've wrestled with confounders and sample size yourself, you stop taking headlines at face value.
- **Work you can actually finish.** A realistic scope and timeline, so the project doesn't quietly die in month four.
- **A track record.** Every project you complete — published or not — makes the next one faster and better.

> **"The question you can actually answer, asked precisely, beats the important question asked vaguely — every time."**
>
> *A principle worth writing on a sticky note above your desk*

The research loop

Research is described in books as a straight line and lived as a loop. You will double back to your question after reading, and back to your reading after your first pass at analysis. That's not failure — it's the process working. Here is the shape of it, and where each stage lives in this guide.

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ITERATE, REVISE & RETURN TO THE QUESTION

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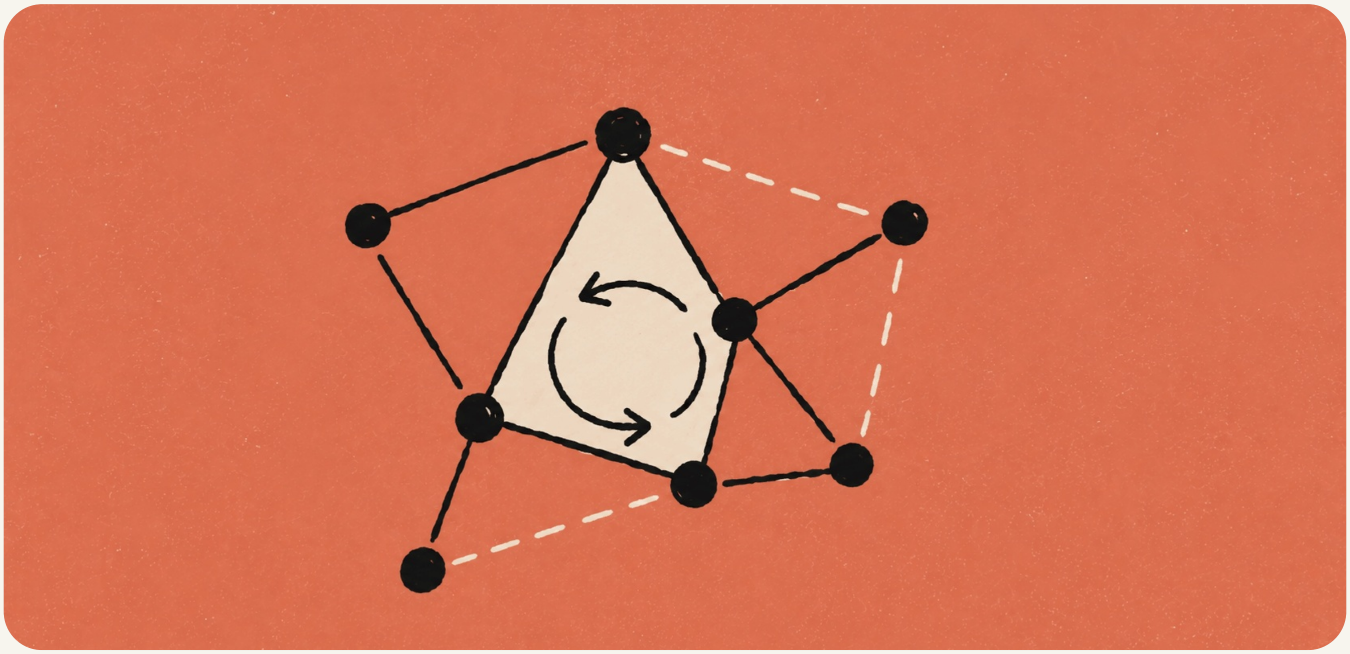


CHAPTER ONE

What Research Actually Is

Before you touch a dataset or open a database, you need to be honest with yourself about what you're doing and why. This chapter is about the difference between curiosity and research, and about building a question sturdy enough to carry a whole project on its back.

IN THIS CHAPTER

- Research versus curiosity — what actually separates them
- Basic and applied research, and why the line matters less than you'd think
- What makes a research question good enough to actually start with

Curiosity is the spark. Research is the discipline.

Wondering why your friend group always fractures the same way, or why one strain of tomato keeps outperforming the others in your backyard, is curiosity. It's the necessary ingredient, but it isn't yet research. Research is **systematic investigation, conducted so that someone else could check your work and reach the same conclusion.** That last clause is the whole game. The moment your method becomes something only you can reproduce — because it lives in your head, or depends on data no one else can see — you've left research and entered anecdote.

This doesn't mean research has to be dry. It means every step has to be a step someone else could retrace: the same question, the same sources, the same procedure, the same honesty about what the data did and didn't show.

BASIC RESEARCH VS. APPLIED RESEARCH

Basic research is driven by the question itself — understanding how something works, with no particular application in mind. **Applied research** starts from a problem that needs solving and works backward to the knowledge required to solve it. In practice the line blurs constantly: a basic question about protein folding becomes the applied foundation of a new drug five years later. Don't let the label decide your project's worth — a rigorously answered basic question is worth more than a sloppily answered applied one.

WHAT MAKES A QUESTION WORTH ASKING

A strong research question passes five tests before you commit months to it. Researchers sometimes call this the **FINER** framework:

Feasible. Can you actually get the data, the sample size, and the time you'd need — with the resources you actually have, not the resources you wish you had?

Interesting. To you, first. You will read hundreds of pages and stare at messy numbers for months; pick something you'll still care about in month six.

Novel. It confirms, extends, or challenges something already known — it isn't just a restatement of a settled question.

Ethical. It can be pursued without causing needless harm to participants, animals, or communities. More on this in Chapter 4.

Relevant. The answer matters to a field, a community, or a decision someone will actually have to make.

Question, or hypothesis?

A **research question** is what you're trying to find out — open, honest, and genuinely unresolved in your mind: *Does sleep duration predict academic performance in high school students?* A **hypothesis** is a specific, testable prediction you derive from that question, usually after your literature review has given you a reason to expect a particular answer: *Students who sleep fewer than seven hours on school nights will show lower GPAs than students who sleep seven or more.* Not every project needs a hypothesis — exploratory and descriptive work often shouldn't force one prematurely. But if you do state one, state it before you look at your results, not after. A hypothesis written to match data you've already seen isn't a hypothesis; it's a caption.

FOUR SHAPES A RESEARCH QUESTION CAN TAKE

SHAPE	WHAT IT ASKS	WATCH OUT FOR
Descriptive	What is the case? Characterizes a population, place, or phenomenon as it stands.	Easy to do badly — a description with no clear population or method is just an impression.
Correlational	Do two things move together? Tests association between variables without manipulating anything.	Association is not causation — the single most common overreach in student research.
Experimental	Does changing X cause a change in Y? Involves deliberately manipulating a variable and measuring the result.	Requires control over conditions most school and early-career projects don't have.
Exploratory	What's going on here, broadly? Used when too little is known to ask a sharper question yet.	Easy to wander — set a boundary on scope before you start, even for exploratory work.

A good rule of thumb: if you can't write your question in one sentence without an "and," it's probably two questions wearing a trench coat.

Split it. Answer one well instead of two poorly.

CHAPTER TWO

The Literature Review

Nobody starts from zero. Somewhere, someone has already asked a version of your question, and the honest thing to do — before you spend a semester rediscovering their answer — is go read it.

IN THIS CHAPTER

- How to search like you mean it — databases, keywords, and snowballing
- Reading in layers instead of cover to cover
- Turning a stack of papers into a synthesis, not a summary

Why it comes before everything else

A literature review isn't a hoop to jump through before the "real" research starts — it **is** real research. It tells you whether your question has already been answered, points you to the methods other people used and the mistakes they made, hands you a working vocabulary for your field, and gives your eventual findings something to stand next to. Skip it, and you risk spending months re-deriving something a graduate student settled a decade ago.

WHERE TO ACTUALLY LOOK

- **Google Scholar** — the best broad first pass, across almost every discipline.
- **PubMed** — biomedical and health research, including clinical studies.
- **JSTOR** — strong for humanities and social sciences, especially older material.
- **Web of Science & Scopus** — built for tracing citations across disciplines.
- **ERIC** — the standard for education research.
- **arXiv, bioRxiv, SSRN** — preprint servers; fast, but not yet peer-reviewed.
- **Your library's databases** — often the only free way into paywalled journals. Ask a librarian — genuinely, it's their favorite question.

SEARCH LIKE A RESEARCHER, NOT A SEARCH ENGINE

Learn four small tricks and your search results improve enormously. Use **quotation marks** around exact phrases ("sleep deprivation"). Use **AND / OR / NOT** to combine or exclude terms. Use a **date filter** to keep recent work separated from foundational older work. And once you find one excellent paper, use **citation chaining**: look backward through its reference list for the work it builds on, and forward through "cited by" to find everyone who has built on it since. A single great paper, chained in both directions, often outperforms an hour of keyword guessing.

Read in layers, not cover to cover

Nobody reads two hundred papers front to back. Good researchers triage.

1. **Abstract first.** If the abstract doesn't relate to your question, stop there — that's not a failure, that's the system working.
2. **Introduction and conclusion next.** This tells you what the authors claim they found and why it matters, without the full methodological weeds.
3. **Skim methods and results** for anything that clears the bar — specifically checking whether their approach resembles what you're planning.
4. **Full close read** only for the small handful that turn out to matter most. Expect this to be maybe one paper in ten.

FROM SUMMARY TO SYNTHESIS

A list of ten one-paragraph summaries is not a literature review — it's an annotated bibliography, and it's a fine starting point. A real review **synthesizes**: it groups sources by theme rather than by publication, and says where they agree, where they conflict, and where nobody has looked yet. A simple **synthesis matrix** — sources as rows, recurring themes as columns — makes the gaps jump out visually in a way a stack of notes never will.

COMMON PITFALLS

Confirmation bias. Saving only the sources that agree with your hunch, and quietly discarding the rest.

Predatory journals. Not everything indexed online has been properly peer reviewed — check the journal, not just the article.

Citation drift. Repeating a claim you found in a summary without tracing it back to where it actually came from.

STYLE	TYPICALLY USED IN
APA	Psychology, education, and most social sciences.
MLA	Literature, languages, and the humanities.
Chicago	History, and many book-length works.
IEEE	Engineering and computer science.

A citation manager — Zotero, EndNote, or Mendeley — will track your sources and format any of these automatically. Start using one on day one; retrofitting citations at the end is nobody's idea of a good week.

CHAPTER THREE

Designing Your Study

This is where a good question either turns into a plan you can actually execute, or quietly falls apart. Design is the bridge between what you want to know and what your data is actually capable of telling you.

IN THIS CHAPTER

- Quantitative, qualitative, and mixed methods — and how to pick
- Variables, and the confounders that quietly wreck good studies
- Study designs, including cohort studies, and how to sample honestly

Quantitative, qualitative, or both

Quantitative research turns your question into numbers — counts, scores, measurements — and uses statistics to test relationships across a sample large enough to generalize from. **Qualitative** research turns your question into words — interviews, field notes, open-ended text — and looks for depth, meaning, and mechanism in a smaller number of cases. **Mixed methods** uses both, often a quantitative pass to find the pattern and a qualitative pass to understand why it exists.

	QUANTITATIVE	QUALITATIVE
Asks	How much? How many? Is there a relationship?	What's happening here, and why?
Data	Numbers — scores, counts, measurements	Words — transcripts, notes, open text
Sample	Larger, aiming to generalize	Smaller, aiming to go deep
Good for	Testing a specific, pre-defined hypothesis	Understanding a poorly-understood process

VARIABLES: THE VOCABULARY FOR EVERYTHING ELSE

An **independent variable** is the one you believe does the influencing — the thing you manipulate or measure as a possible cause. A **dependent variable** is the outcome you're measuring the effect on. A **confounding variable** is a third factor, related to both, that can make an association look causal when it isn't — ice cream sales and drowning deaths both rise in summer, but the confounder is heat, not dessert. A **control variable** is one you deliberately hold constant so it can't interfere with your comparison.

Before any of this works, you need to **operationalize** your concepts — turn something abstract into something you can actually measure. "Academic performance" becomes GPA, or a specific test score. "Stress" becomes a validated self-report scale, or a cortisol measurement. Vague concepts produce vague results; the operationalization step is where a lot of otherwise-good projects quietly go wrong.

Study designs, plainly explained

DESIGN	WHAT IT IS	MAIN LIMITATION
Cross-sectional	A single snapshot of a population at one point in time.	Can't establish which came first — the exposure or the outcome.
Case-control	Starts with an outcome (cases vs. controls) and looks backward for exposures.	Prone to recall bias; relies on selecting good controls.
Cohort	Follows a defined group forward through time, tracking exposures and outcomes.	Slow and expensive; people drop out along the way.
Randomized controlled trial	Randomly assigns participants to treatment or control, then compares outcomes.	Often impossible or unethical outside a lab or clinical setting.

A CLOSER LOOK AT COHORT STUDIES

Since the word "cohort" comes up constantly in research and is often misused — it's worth being precise. A **cohort** is simply a group of people who share a defining starting characteristic — born in the same year, diagnosed in the same month, working the same job — who are then followed forward through time. A **prospective cohort study** identifies that group now and tracks them into the future. A **retrospective cohort study** identifies a group that shared a starting point in the past and traces what already happened to them, using existing records.

Cohort studies are the workhorse of studying **incidence** — how often something newly occurs over time — and they let you study several outcomes from a single starting exposure, because you keep watching after the study begins. Their cost is real, though: prospective cohorts can run for years or decades, participants drop out along the way (a problem researchers call **loss to follow-up**, or attrition), and confounding variables can still slip in undetected. A classic, well-known example is the Framingham Heart Study, which has followed generations of residents of Framingham, Massachusetts since 1948 and quietly reshaped almost everything we know about cardiovascular risk factors.

Sampling: population vs. sample

Your **population** is everyone your question is actually about. Your **sample** is the subset you can realistically study. The gap between the two is where most bias sneaks in — a "study of teenagers" that only surveys students at one wealthy suburban school isn't really about teenagers; it's about that school.

- **Simple random sampling** — every member of the population has an equal chance of selection. The gold standard, and often the hardest to actually execute.
- **Stratified sampling** — the population is split into subgroups (strata), and you sample randomly within each, guaranteeing representation.
- **Cluster sampling** — you randomly select whole groups (schools, clinics, neighborhoods) rather than individuals, then sample within them.
- **Convenience sampling** — whoever is easiest to reach. Fast and common in student research, but the weakest for generalizing.
- **Snowball sampling** — existing participants refer future ones. Useful for small or hard-to-reach populations.

BIAS WORTH NAMING BEFORE IT HAPPENS TO YOU

- **Selection bias** — your sampling method systematically favors certain people over others.
- **Response bias** — people answer inaccurately, often to appear more favorable.
- **Survivorship bias** — you only observe the cases that "survived" some process, missing the ones that dropped out or failed.
- **Recall bias** — people misremember the past, especially in retrospective designs.

Internal validity is how confidently you can say your design actually tested what you claim it tested. **External validity** is how confidently your findings generalize beyond your specific sample. A tightly controlled lab study often maximizes the first at the expense of the second — know which one your project needs more, and design toward it deliberately.

CHAPTER FOUR

Research Ethics & Approvals

The fastest way to invalidate months of good work is to skip the parts that protect the people in your study. Ethics isn't red tape bolted onto research from the outside — it's part of the method.

IN THIS CHAPTER

- What an IRB actually reviews, and when you need one
- Informed consent, and what it genuinely demands of you
- The line between honest error and research misconduct

Institutional Review Boards

Any research involving human participants — at a university, a hospital, or increasingly a high school — needs review by an **Institutional Review Board (IRB)** or equivalent ethics committee **before** you collect a single data point, not after. The IRB's job is to weigh the risks to participants against the value of the knowledge gained, and it's not optional even when your intentions are good. Most reviews fall into one of three tiers:

- **Exempt.** Minimal-risk research, often using existing, de-identified data or anonymous surveys of adults.
- **Expedited.** Minimal risk, but involving direct interaction with participants or identifiable data.
- **Full board review.** Anything involving vulnerable populations, sensitive topics, or more than minimal risk.

Start this process embarrassingly early. Review boards meet on their own schedule, not yours, and a submission that needs revisions can add weeks you didn't budget for.

INFORMED CONSENT

Consent isn't a signature — it's a genuine understanding, given freely. A proper consent process explains the purpose of the study, what participation actually involves, the real risks and benefits, the fact that participation is voluntary, the right to withdraw at any time without penalty, and how confidentiality will be protected. When participants are minors, you'll typically need both **parental or guardian consent** and the minor's own **assent** — their affirmative, age-appropriate agreement to take part.

Protecting the data you collect

Anonymized data has had all identifying information permanently and irreversibly removed — nobody, including you, can trace it back to a person. **De-identified** data has had direct identifiers stripped but could theoretically be re-linked with a separate key. **Confidential** data is identifiable but protected — you know who someone is, but you've committed not to disclose it. Know which of the three you're actually promising participants, because they are not interchangeable, and store whatever key or code links them under separate, secured access.

RESEARCH INTEGRITY

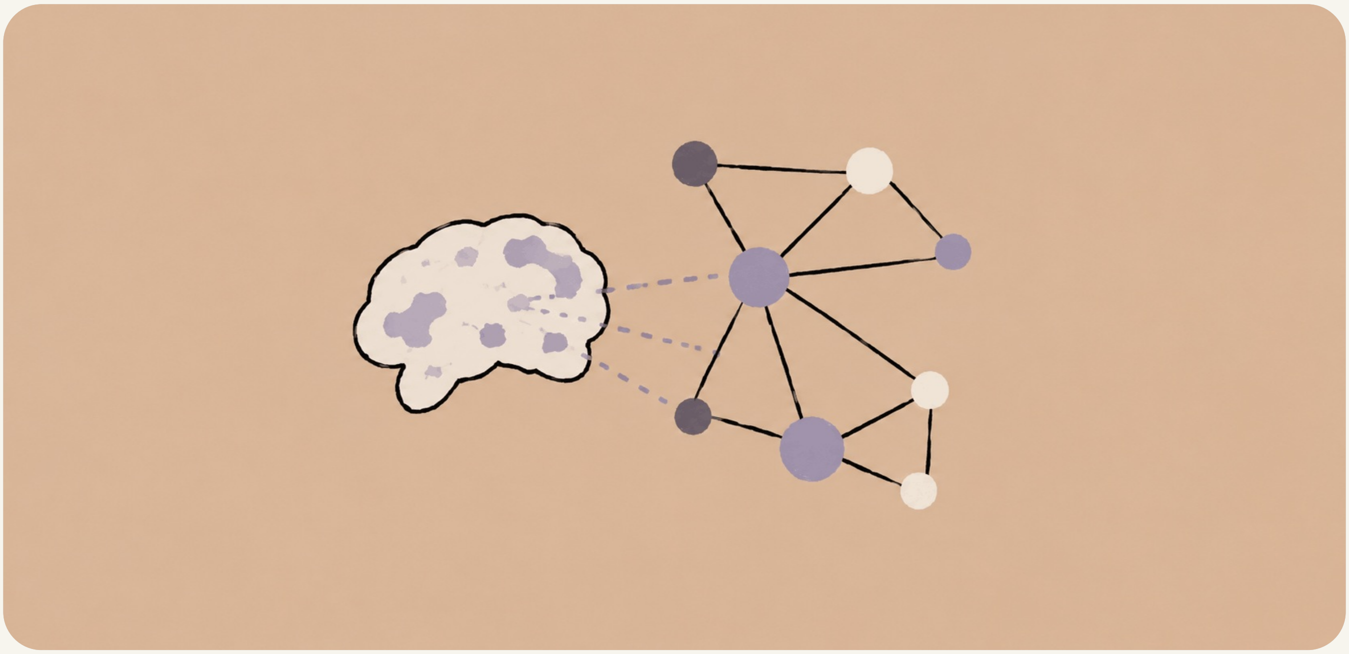
Three terms describe the ways research goes wrong on purpose, and they're worth knowing precisely because the consequences for each are severe and career-ending:

- **Fabrication** — making up data or results that were never actually collected.
- **Falsification** — manipulating real data, equipment, or processes so the record misrepresents what happened.
- **Plagiarism** — presenting someone else's ideas, words, or results as your own without credit.

Honest error — a miscalculation you catch and correct — is a normal part of research and not misconduct. The difference is intent, and it's exactly why keeping a clear, dated record of your process matters: it lets you, and anyone else, tell the difference later.

AUTHORSHIP AND CONFLICTS OF INTEREST

Authorship is earned through substantial intellectual contribution — to the design, the analysis, or the writing — not through seniority or proximity to the project. Agree on authorship order early, in writing, before submission deadlines make the conversation tense. And disclose any **conflict of interest** — funding sources, personal relationships, financial stakes — that could reasonably make a reader question your objectivity, even if you're confident it didn't actually bias you.



CHAPTER FIVE

Collecting & Managing Your Data

Data doesn't organize itself, and the instrument you use to collect it shapes everything you'll be able to say afterward. This is the unglamorous chapter that quietly makes or breaks the glamorous one.

IN THIS CHAPTER

- Choosing the right instrument: surveys, interviews, and existing datasets
- Building a data management plan before you have data to manage
- Cleaning data honestly, without cleaning away inconvenient findings

Choosing your instrument

How you collect data isn't a logistics decision made after the design is set — it **is** part of the design.

Surveys and questionnaires. Efficient at scale. Avoid leading questions ("How much did you enjoy…" assumes enjoyment), keep Likert scales consistent in direction, and always pilot-test on five or ten people before sending it to five hundred — you will find a confusing question every time.

Interviews. Structured interviews use a fixed script for consistency; **semi-structured** use a guide but allow follow-up; **unstructured** are closer to guided conversation. Depth trades off against comparability as you move from structured to unstructured — pick deliberately.

Observation. Recording behavior as it happens, without relying on self-report. Powerful, but time-intensive and vulnerable to the observer effect — people often act differently when they know they're being watched.

Secondary and existing datasets. Government open-data portals, published cohort data, and institutional records can save months of collection — provided the data was collected in a way that actually fits your question, and you have permission to use it.

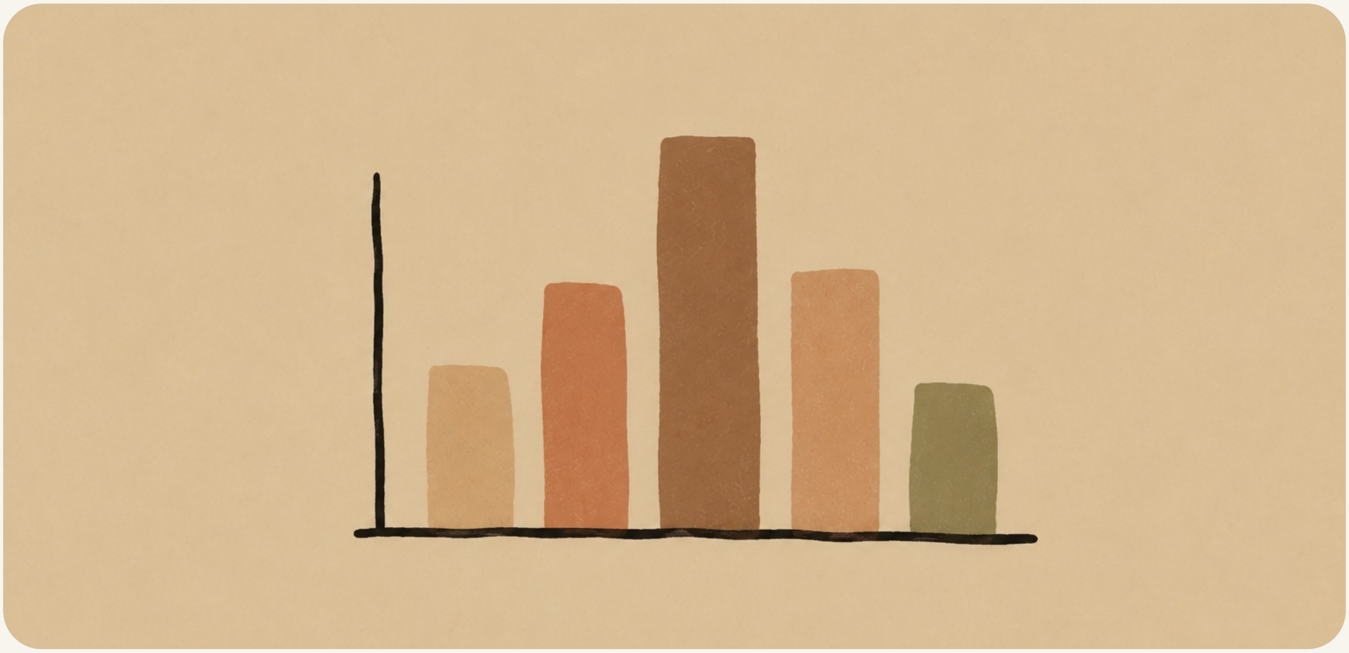
Write a data management plan first

Before you collect anything, decide: how will files be named, so version three doesn't get confused with "final_final_v2"? Where are backups stored, and how many copies exist in how many places? Who has access, and how is that access logged? What does each column or code in your dataset actually mean — written down in a **codebook**, not held only in your memory? Five minutes spent on this before data collection saves days of archaeology afterward.

CLEANING DATA HONESTLY

Real data is messy: missing responses, obvious entry errors, and outliers that may be genuine or may be a typo. Decide your rules for handling each **before** you look at whether they help or hurt your hypothesis — deciding afterward is how good researchers back into p-hacking without ever meaning to. Document every exclusion you make, and report it. A results section that quietly omits how many participants were dropped, and why, is hiding part of the story.

TOOL	BEST FOR
Excel / Google Sheets	Small datasets, quick looks, and anyone just starting out.
R	Statistical analysis and publication-quality plots; the standard in many academic fields.
Python (pandas)	Data cleaning and analysis at scale, especially alongside other code.
SPSS	Point-and-click statistics, common in social science and psychology.
REDCap / Qualtrics	Building and securely collecting survey or clinical data directly.



CHAPTER SIX

Analyzing Your Data

Analysis is where numbers turn into a claim. The right test won't rescue a badly designed study — but the wrong test can absolutely ruin a well-designed one.

IN THIS CHAPTER

- Descriptive versus inferential statistics, and choosing the right test
- Statistical significance, effect size, and the trouble with p-hacking
- Visualizing your data without accidentally misleading anyone

Descriptive vs. inferential statistics

Descriptive statistics summarize the data you actually have — mean, median, mode, standard deviation, the shape of a distribution. They make no claim beyond your sample. **Inferential statistics** use your sample to make a claim about the broader population it came from — testing whether a pattern you observed is likely to be real, or plausibly just noise. Every inferential test rests on assumptions about your data (its distribution, its independence, its sample size); check them before you trust the output.

CHOOSING THE RIGHT TEST

YOU'RE COMPARING…	REACH FOR…
Two group means	**t-test**
Three or more group means	**ANOVA**
Two categorical variables	**Chi-square test**
The strength of a relationship between two numeric variables	**Correlation (Pearson's r)**
How well one or more variables predict an outcome	**Regression**

This table is a starting compass, not a substitute for understanding why each test works the way it does — when the stakes are real, a statistics consultant or a careful textbook chapter is worth the hour it costs you.

Statistical significance isn't the finish line

A **p-value** tells you how surprising your result would be if there were truly no effect at all — conventionally, $p < .05$ is called "statistically significant." But statistical significance is not the same thing as importance. With a large enough sample, a genuinely trivial difference can become "significant." That's why serious analysis also reports **effect size** — how large the difference actually is in practical terms — alongside the p-value, not instead of it.

Watch for **p-hacking**: running many tests, or slicing your data many different ways, until something crosses the .05 line by chance, then reporting only that result. The related **multiple comparisons problem** means that the more tests you run, the more "significant" results you'll find by pure chance alone. The fix is discipline: decide your analysis plan before you see the results, and report every test you ran — not just the ones that worked out.

VISUALIZE WITHOUT MISLEADING

- Match the chart to the data: **bar charts** for categories, **line charts** for change over time, **scatter plots** for the relationship between two numeric variables.
- Start bar chart axes at zero — truncating an axis is the single most common way honest data becomes a misleading picture.
- Label your axes and units. A beautiful chart that requires a caption to be understood has failed at its one job.

CHAPTER SEVEN

Writing It Up

A brilliant study with a confusing write-up might as well not exist — nobody can build on results they can't parse. Good scientific writing isn't about impressive vocabulary; it's about getting out of the way of your own findings.

IN THIS CHAPTER

- The IMRaD structure, section by section
- Writing an abstract someone will actually want to read
- Figures, tables, and the mistakes that quietly undercut good results

The IMRaD structure

Almost every empirical paper you'll read or write follows the same skeleton, usually called **IMRaD**. It exists because readers all want the same things, in the same order, and fighting the convention just makes your paper harder to navigate.

1. **Introduction.** What's known, what's missing, and what you're specifically contributing. Ends with your research question or hypothesis, stated plainly.
2. **Methods.** Exactly what you did — in enough detail that someone else could repeat it. Sample, design, materials, procedure, and analysis plan.
3. **Results.** What you found, reported neutrally, without interpretation yet. Tables and figures carry most of the weight here; the prose should guide the reader through them, not repeat every number in the text.
4. **Discussion.** What it means. Connect back to your original question, compare to prior literature, acknowledge limitations honestly, and suggest what should be studied next.

Writing an abstract worth reading

Your abstract will be read by ten times more people than your full paper, and for many of them it's the only part they'll ever see. In roughly 250 words, state the question, the method, the key result (with a number, if you have one), and why it matters. Write it last, after you know exactly what you found — not first, as a promise you then have to fulfill.

FIGURES AND TABLES

Every figure and table should be understandable on its own, from its caption alone, without hunting through the text.

Don't make a table out of something better said in a sentence, or a paragraph out of something better shown in a chart.

Number them in the order they're referenced, and reference every single one somewhere in your text.

MISTAKES THAT UNDERCUT GOOD RESULTS

Overclaiming causation. If your design was correlational, your language has to stay correlational too — "associated with," not "caused."

Blending results and discussion. Report what you found first; argue about what it means second. Mixing the two makes both harder to trust.

Citation drift. Every claim that isn't your own finding needs a citation tracing back to where it actually came from.

CHAPTER EIGHT

Sharing & Presenting Your Work

Research that stays on your hard drive hasn't finished happening. This last chapter is about the moment your work meets other people — and how to make that moment count.

IN THIS CHAPTER

- How journals and peer review actually work
- Conferences, posters, and talks — and how to prepare for each
- Building a track record, one finished project at a time

How peer review actually works

You submit a manuscript to a journal; an editor decides whether it's a plausible fit and sends it to two or three anonymous experts in the field for review. Reviewers assess the work and typically respond with one of four verdicts: accept, minor revisions, major revisions, or reject. **Major revisions is normal, not a failure** — most published papers went through at least one round of substantial rewriting first. Address every reviewer comment directly in your response, even the ones you disagree with; explain your reasoning rather than ignoring them.

A growing number of fields also use **preprint servers** — arXiv, bioRxiv, SSRN — to share findings immediately, before formal peer review completes. Preprints speed up the exchange of ideas but haven't yet been vetted, so read and cite them with that caveat in mind.

STUDENT RESEARCH COMPETITIONS

Formal publication isn't the only path. Science fairs and student research competitions run their own version of peer review — judged interviews, written evaluation, sometimes a full symposium — and are an excellent, lower-stakes place to practice defending your work out loud before you ever face an anonymous reviewer.

Designing a poster people actually stop for

A conference poster is read from six feet away by someone deciding, in about three seconds, whether to come closer. Lead with your biggest finding in large type, not your title. Use a clear visual hierarchy — headline, then one key figure, then supporting detail — and resist the urge to fit your entire paper onto it. If someone has to read a paragraph to understand your headline result, the poster has already lost them.

GIVING A RESEARCH TALK

Structure it the way you'd structure the paper: the gap you're filling, what you did, what you found, what it means — in that order, every time. Rehearse out loud, not just in your head; the two take noticeably different amounts of time. And prepare for the questions you're most nervous about in advance — the biggest weakness in your design is exactly the thing a sharp audience member will ask about first.

BUILDING A TRACK RECORD

One finished, honestly-reported project is worth more than three abandoned ambitious ones. Say yes to co-authoring on someone else's work while you build your own — it teaches you the process from the inside. And consider replicating a small study you admire before designing an original one; replication is undervalued and teaches you more about methodology than almost anything else you can do early on.

Planning your timeline

Textbooks describe research as though it happens in the order you read about it. In practice, the phases below overlap constantly — you'll still be reading literature while you collect data, and still cleaning data while you draft your introduction. What follows is a realistic shape for a school-year-length independent project, not a rule.

PHASE 1 — EXPLORE & QUESTION (Weeks 1–3)

Read broadly before committing — talk to a mentor, skim a few review articles, follow your actual curiosity.

Draft a research question and run it through the FINER checklist from Chapter 1.

PHASE 2 — LITERATURE REVIEW (Weeks 2–6, overlapping)

Search systematically, read in layers, and build your synthesis matrix as you go — not all at the end.

Let the literature sharpen your question; expect at least one real revision here.

PHASE 3 — DESIGN & APPROVAL (Weeks 5–9)

Lock your design, your variables, and your instrument. Pilot-test whatever you can.

Submit for IRB or ethics review the moment your design is stable — this step is often the true bottleneck, not the data collection itself.

Planning your timeline, continued

PHASE 4 — DATA COLLECTION (Weeks 9–20)

Build in slack — recruitment is almost always slower than you plan for, and follow-up takes longer than the first contact.

Keep your data management plan running from day one: name files consistently, back up constantly, log every exclusion.

PHASE 5 — ANALYSIS (Weeks 18–24, overlapping)

Clean before you analyze, and decide your analysis plan before you see whether it flatters your hypothesis.

Budget real time for the result you didn't expect — it will need double-checking, not just reporting.

PHASE 6 — WRITE-UP & SHARE (Weeks 22–30)

Draft in IMRaD order, but write your abstract last, once you actually know what you found.

Leave time to present it out loud, to a real audience, before any final deadline — questions you can't yet answer are worth finding early.

Timelines flex enormously with scope. A tightly-scoped survey study can compress this whole arc into six weeks. A prospective cohort study can stretch Phase 4 alone into years. Scope your ambition to your actual runway — a finished small study beats an unfinished ambitious one, every time.

Essential research terminology

Hypothesis. A specific, testable prediction derived from a research question, stated before data is examined.

Variable. Anything that can change or be measured; commonly split into independent (the presumed cause) and dependent (the outcome).

Population & sample. The full group your question concerns, and the smaller subset you actually study.

Confounder. An unaccounted-for variable linked to both the exposure and the outcome, capable of creating a false appearance of a relationship.

Cohort. A group sharing a defining starting characteristic, followed forward through time.

Control group. The comparison group that does not receive the intervention being tested, used as a baseline.

Bias. Any systematic (non-random) error that skews results in a particular direction.

Operationalization. The process of turning an abstract concept into something concretely measurable.

Validity. How well a study measures what it claims to measure (internal) or how well its findings generalize beyond the sample (external).

Reliability. How consistent a measurement is when repeated under the same conditions.

p-value. The probability of observing a result as extreme as yours if there were truly no effect — not the probability the hypothesis is true.

Effect size. A measure of how large a difference or relationship actually is, independent of sample size.

Statistical significance. A result unlikely to have occurred by chance alone, conventionally at $p < .05$.

IRB. Institutional Review Board; the ethics committee that must approve human-subjects research before it begins.

Informed consent. A participant's voluntary, knowledgeable agreement to take part, given freely and without coercion.

Essential terminology, continued

Literature review. A systematic survey and synthesis of existing research relevant to a question.

Longitudinal study. Research that follows the same subjects over an extended period, observing change over time.

Meta-analysis. A statistical technique combining results from many independent studies into one overall estimate.

Replication. Repeating a study's methods to see whether its findings hold up again.

Sampling frame. The actual list or source from which a sample is drawn — rarely identical to the true population.

Peer review. Independent evaluation of a manuscript by other experts in the field before publication.

Abstract. A short, self-contained summary of a study's question, method, results, and significance.

Citation. A formal reference crediting the original source of an idea, method, or finding.

Keep this list close for your first few projects. The vocabulary stops feeling foreign faster than you'd expect — usually somewhere around your second literature review.

Nishan exists to put real research within reach of students who've never been shown how it actually works — pairing them with mentors, and walking them through exactly the process laid out in this guide.

If you're ready to start your own project, or want a mentor beside you while you do, we'd love to hear from you.

NISHAN

Student Research & Mentorship