



Early Age Development
CONNECTING EDUCATION WITH LIFE

HIGH-TECH ROUTE

Twelve real problems. Find one. Fix it. Prove it.

Twelve complete projects using only free tools that run in a browser. Nothing to buy and nothing to install. A free Google account covers every tool, and every step names an offline alternative. Every step is written out: what to do, what to write down, how you know it is finished, and the mistake most people make.

12

projects, one per industry

120

steps, written out in full

/20

how the work is marked

0

cost, to anyone, ever

THE TWELVE PROJECTS IN THIS BOOKLET

01 The Sixty-Litre Dinner

Agriculture & Climate

03 The Prayer-Time Error

Space & Cosmos

05 The Four-Hundred-Rupee Leak

Energy & Smart Systems

07 Where The Money Actually Went

FinTech & Ethical Economy

09 The Lie This Street Believes

Media & Deepfake

11 The Cheapest Clean

Matter & Chemistry

02 The Sugar You Did Not Order

Health & Preventive Medicine

04 The Thing That Keeps Breaking

Engineering & Robotics

06 The Ten Minutes That Teach

Education & Future Learning

08 The Rule Nobody Follows

Law & Governance

10 The Trigger

Psychology & Behaviour

12 The Question Nobody Asked

Sociology & Future Society

We print this with your school's name on the cover. Your brand on the front, ours beneath it, printed and delivered to your campus - and one of your teachers trained free. Tell us the route and how many.

Ask for a school edition

earlyagedevelopment.com
support@earlyagedevelopment.com
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Start here – what you are actually going to do

This page has no special words in it. Everything after it explains how the work is checked, and you do not need any of that today.

Pick one thing that annoys your household. The electricity bill. The food that gets thrown away. A rule nobody follows. Something you already complain about.

Measure it for about two weeks. Properly, the same way each time, and write the number down with the date beside it. Do not change anything yet - this number is the whole foundation, and you cannot get it back later.

Then change one thing. One. Not five. Something that costs nothing.

Measure the same number again, the same way, for three more weeks.

At the end you can say a sentence like this one, and back every word of it:

"Our fridge was costing us four hundred and thirty rupees a month. I moved it away from the cooker and it dropped to three hundred and ten. Here is how I know, and here is what else might explain it."

That is the entire method. Six weeks, a few hours a week, alongside school.

Six things people ask first

How old do I need to be? There is no age. If you can read these steps and write down a number, you can start.

Do I need to buy anything? No. Nothing at all. Every project works with a pen and paper.

Do I need a teacher? No. Every step is written out. A teacher helps, but nothing here waits for one.

What if my change does not work? That is a real result and it scores higher than a win you cannot prove. Nobody loses marks for an honest failure.

What does it cost? Nothing. Reading, running and marking a project is free.

Where do I start? Turn to the contents, pick the project whose title annoys you most, and read its first three steps tonight.

If a word in this booklet stops you

There is a page called **The words this booklet uses** a few pages ahead. Seventeen words do all the work in here, and that page explains every one of them in plain language.

How this booklet works

Every project in here runs the same way. You measure something ordinary in your own life until you can say what it costs. Then you change one thing and measure it again. That is the whole method, and it is why the result is worth something to somebody other than your teacher.

ACT 1 - STEPS 1 TO 5

Find the problem

Measure it. Talk to one person who deals with it for a living. Work out what it costs, per week or per year. You end with a costed problem statement: whose problem, what it costs, and the evidence behind the number.

ACT 2 - STEPS 6 TO 10

Fix it and measure

Change one thing. Not five. Measure the same quantity the same way and report what happened, including when nothing happened. You end with a before figure, an after figure, and an honest answer about what caused the difference.

Nine things you hand in – progress reads 0/9

#	DELIVERABLE	STRAND	DUE	WHAT IT FEEDS
1	Question card	Research	Week 2	The artefact - whether the change is traceable to a costed problem
2	Expert interview pack	Outreach	Week 3	Gate one - the expert row
3	Evidence log	Research	Week 4	Gate two - the baseline; and the artefact
4	Failure log	Process	Week 5	The process and its failures
5	The build	Design	Week 5	The artefact
6	One-page explainer	Design	Week 5	The artefact
7	Identity card	Branding	Week 5	The artefact
8	Relations ledger	Outreach	Week 6	Gate one - all ten relationships
9	Defence video	Defence	Week 6	The defence

Two gates. Neither can be waived.

The ten relationships: This is a gate, not a scored criterion. Ten logged relationships are required per project: 1 expert, 3 people the problem affects, 3 peers who reviewed the work before it was finished, 3 people who saw the finished work and replied. Until all ten are logged with evidence, the work is not marked at all and no score out of 20 is issued. The assessor returns it unmarked with the missing rows named.

The baseline: This is a gate, not a scored criterion. An effect claimed without the same quantity measured before the change is returned unmarked, because there is nothing to measure against. A baseline counts only when it carries a number with its unit, the dates it was taken on, the instrument or source behind it, and a written method that the after-measurement then repeats. Where any row below is true, the assessor issues no score out of 20, names the row, and sets the baseline again with the after-period rerun from it.

Four tiers – capability, never age

Declare your tier in week two. It can be revised down once, without penalty, before your evidence log goes in. Nobody is asked for a birthday or a grade.

TIER	WHAT "SECURE" EVIDENCE MEANS HERE
Starter	Secure means the written method was followed with no gap: same instrument, same times, every zero entered rather than left blank, and one stranger asked in person. Sample size and published comparison are not asked for here.
Practitioner	Secure means the learner chose what to measure and defends that choice, every borrowed figure is cited to its page or table, and one chart is read correctly by a stranger with nobody standing there explaining the axes.
Researcher	Secure means the protocol was written and dated before the first reading, three after-weeks are justified rather than assumed, and the error from the instrument, the divisor and any borrowed coefficient is quantified rather than mentioned.
Contributor	Secure means the figure is set against published work by name, the method survives a specialist who disagrees with it, and every raw reading and source is published openly so a stranger can recompute the result.

How the work is marked

The artefact – 6

Is the one change traceable to the costed problem, and was the same quantity measured the same way before and after, so a stranger could repeat both halves?

The process and its failures – 6

Does the record show a change that was actually run, slipped somewhere, and was measured honestly anyway, rather than a plan written up after the result was known?

The defence – 8

Asked whether this would have happened anyway without the change, does the learner reason from their own before-and-after data, or repeat the result more slowly?

A well-measured failure scores higher than an unmeasured success.

An effect claimed without a baseline measured before the change is returned unmarked, because there is nothing to measure it against. If your change did not work and you measured it properly, say so plainly - it costs you nothing and it is worth more than a tidy number nobody can check.

Before you knock on any door

This programme sends you to measure real households and to talk to real adults. That is what makes the result worth something, and it is the part with rules. These are not suggestions.

Consent, every time

- Ask before you measure anybody's home, spending or behaviour, in words, and write down that they agreed.
- Anybody may stop at any point without giving a reason. When they do, stop the same day and do not argue.
- Never call twice at a door that said no, and never go back to anyone who asked not to be called on again.
- If you are under 18, a parent or guardian signs before you contact any adult outside your school.

Where you go, and with whom

- Never go to fieldwork alone. Two of you, or a known adult present.
- Never enter anybody's home. Measure at a counter, a gate, a reception, your school, or on a call.
- An adult at school and an adult at home know where you are and when you will be back.
- Never open, unscrew, reach into or climb to reach anything. Read meters and machines from a normal standing distance or not at all.

What never goes into a submission

Phone numbers, addresses, email addresses, house numbers, bank or card numbers, anybody's income, a photograph of a face nobody agreed to, or a photograph of another person's child. Names only, and codes where a name is not needed. Never record a complaint about a named person - write the problem, not the accusation.

If you are running this with a class

Your school supplies the consent form, the child protection policy and the offsite risk assessment that apply where you are, and EAD does not. Ask your safeguarding lead which ones to use before week one. **[SCHOOL SAFEGUARDING LEAD - CONFIRM]**

If a conversation ever turns to something that worries you about a person's safety, stop the project conversation, promise no secrecy, write down what was said in their own words the same day, and hand it to an adult you trust.

The words this booklet uses

Fifteen words do most of the work in here. Learn these and every project reads easily.

WORD	WHAT IT MEANS HERE
Baseline	The number as things are now, before you change anything, with the date and the instrument written beside it. Everything is compared against this, and you cannot get it back once you have changed something.
After-figure	The same number, measured the same way, once the change has been running.
Costed problem statement	One page saying whose problem it is and what it costs them per week or per year - in money, litres, minutes or waste - with the evidence behind that number.
The one change	The single thing you change. One, not five. If two things move at once, nobody can say which one caused the result.
Confounder	Something else that changed during the same weeks and might explain your result instead of your change - a wedding, a price rise, a guest, a season. You list them rather than hide them.
Instrument	The thing you measure with: a scale, a meter, a stopwatch, a tally sheet. Use the same one before and after.
Divisor	What you divide by to make figures comparable - per person, per plate, per week. Keep it the same both times.
Protocol	The written rule for how you will measure, agreed and dated before you start, so the after-measurement repeats the before exactly.
Sample	The people, days or items you actually measured, out of all the ones you could have.
Null result	The change made no difference. This is a real result and it scores well when it is measured properly.
Artefact	The thing you hand in that shows the work: the chart, the log, the build, the explainer.
Evidence log	Every reading with its date, time and source. The spine of the whole project.
Failure log	Everything that went wrong, dated, and what each slip did to the comparison. Six of the twenty marks live here.
Relations ledger	Ten names with roles, dates and what each person replied.
Defence	Ten to twelve minutes of questions you have not seen, about your own numbers. Eight of the twenty marks.
Gate	A rule that must be met before anything is marked at all. There are two, and neither is a score.
Tier	How deep your work goes - Starter, Practitioner, Researcher or Contributor. You declare it. It is never your age.

The twelve projects in this booklet

1. The Sixty-Litre Dinner

Agriculture & Climate - litres per plate

2. The Sugar You Did Not Order

Health & Preventive Medicine - level teaspoons per household per week

3. The Prayer-Time Error

Space & Cosmos - minutes, signed as observed minus published

4. The Thing That Keeps Breaking

Engineering & Robotics - failures per 100 uses

5. The Four-Hundred-Rupee Leak

Energy & Smart Systems - rupees per month

6. The Ten Minutes That Teach

Education & Future Learning - per cent of the immediate score retained

7. Where The Money Actually Went

FinTech & Ethical Economy - rupees per week

8. The Rule Nobody Follows

Law & Governance - percentage of observed instances

9. The Lie This Street Believes

Media & Deepfake - per cent of twenty people

10. The Trigger

Psychology & Behaviour - occurrences per day

11. The Cheapest Clean

Matter & Chemistry - rupees per use, against a removal score out of five

12. The Question Nobody Asked

Sociology & Future Society - minutes per household per week, reported as hours per street per month

The Sixty-Litre Dinner

Weigh tonight's dinner, then count the litres of water standing behind it that nobody at the table sees.

THE QUESTION

How many litres of water and how many rupees stand behind one plate of a dinner you actually eat, and which single item carries most of both?

Every litre on your plate was rained on, pumped or piped somewhere upstream, and the food industry is now asked to report those litres to buyers, lenders and regulators. Water-footprint accounting is paid work in farming, food processing and export, because a shipment with no defensible water number is getting harder to sell. The method you use on one dinner is the method used on a whole supply chain: mass, a published coefficient, a cited source, and an honest statement of what the number leaves out.

ACT 1 - FIND

You take one dinner your household cooks anyway and account for it item by item: raw mass on one plate, rupees actually paid, and litres of water per kilogram taken from a published source you name beside the number. You also weigh what gets thrown away across seven days, because food thrown out carries its whole footprint with it.

A one-page costed problem statement carrying four lines: whose dinner, litres of water per plate, rupees per plate, and litres and rupees per year at the rate this household actually eats it. Beside it sits a bar chart of litres per item, largest bar first, and a source line against every coefficient used.

ACT 2 - FIX

You change exactly one thing - an ingredient swapped, a portion cut, a shop changed, or one form of waste stopped - and cook the same dish on three dates across three weeks. Every weighing, price and source is repeated identically, so the only moving part is the change you named.

A four-bar chart of litres per plate, baseline against weeks one, two and three, with the mean after-figure, the difference in litres and rupees per year, a named list of confounders, and the household's recorded answer on whether the change stays.

YOU MEASURE

litres of water behind one plate of one dinner

BEFORE

Raw mass in grams of every ingredient on one plate, multiplied by a published litres-per-kilogram figure with its source recorded beside it, plus the litres attached to food weighed into the bin over the same seven days. Taken before anything is changed.

AFTER

The identical dish measured the identical way on three dates across three weeks, using the same scale, the same divisor and the same published sources, reported as a mean with all three weeks shown separately.

Safety and ethics - not optional

- Measure a meal the household was cooking anyway. Do not cook anything extra for this project and do not use the stove, hot oil or a sharp knife for it - every weighing is of raw, cold ingredients before they go in the pot.
- Nobody's plate gets smaller for the sake of the number. Weigh what is served, and if a portion or an ingredient changes in Act 2, agree it first with the person who has to eat it.
- Weigh raw meat, fish and eggs in a bowl or on a plate, never directly on the scale surface. Wash your hands and the bowl afterwards, before touching the notebook or the phone.
- Handle only your own household's food waste, in a bowl kept for the purpose, and wash your hands after every weighing. Never open a neighbour's bin, a shop's bin or a street container.

WHAT YOU USE - HIGH-TECH ROUTE

Google Sheets - the ingredient table, the per-person division, the litres and rupee arithmetic in visible formula cells

Water Footprint Network (waterfootprint.org), Product Gallery and WaterStat tables - published litres of water per kilogram for crops and animal products

Our World in Data, the page 'Environmental Impacts of Food Production' - freshwater use per kilogram, with a downloadable CSV, for any ingredient the first source is missing

Datawrapper, free plan - the litres-per-item bar chart and the four-week before-and-after chart

Google Docs - the evidence log, the one-page explainer and the interview pack

Google Drive - dated folders holding the plate photographs and the photographed scale readings

Everything runs in a browser and a kitchen: a free spreadsheet holds the weighings, published open databases supply the litres per kilogram, and a free chart tool turns the result into one picture.

Act 1 – find the problem steps 1 to 5, ending with a costed problem statement

1 Choose the meal 30 MINUTES

Pick one dinner your household cooks anyway and lock it as the meal you will measure four times.

- Ask whoever cooks which dinner repeats most often, and write down the exact dish and the night it is usually made.
- List every item that goes into it on one line each, including oil, salt, tea and anything drunk alongside it.
- Photograph the raw ingredients laid out on the counter before cooking, with a spoon in frame for scale.
- Photograph one plate as it is served and again after eating, from the same standing position both times.
- Open a Google Sheets file named 'Sixty-Litre Dinner' with columns: item, raw grams per person, price paid, litres per kilogram, source, litres on the plate.

WRITE THIS DOWN

The dish name, the date, the number of people served, and one row per ingredient in the sheet.

DONE WHEN

The sheet has one row per item and a dated Google Drive folder holds the before and after photographs of the same plate.

Watch out. Choosing a meal you never normally eat because it sounds interesting. Pick the repeated, boring one - you have to cook it three more times.

2 Weigh the plate 45 MINUTES

Measure the raw mass of every ingredient that ends up on one person's plate.

- Zero the scale with the empty bowl on it, then weigh each raw ingredient in grams before it goes in the pot.
- Where the pot serves five, weigh the whole pot's ingredients and divide every figure by five, typing the division into the cell so it can be checked.
- Measure oil, milk and water in a marked jug and write the millilitres, noting that oil is lighter than water and stating the conversion you used.
- Weigh the served plate as well and record both raw and cooked mass, because the published water figures attach to raw mass.
- Photograph the scale display for at least three items and file the photographs in the dated folder.

WRITE THIS DOWN

Raw grams per person for every item, the divisor used, and a marked note against anything estimated rather than weighed.

DONE WHEN

Every row has a raw mass in grams per person and no cell contains the word 'about'.

Watch out. Weighing cooked rice and treating it as raw. Cooked grain has absorbed water and weighs far more than the dry grain it came from - weigh it dry, or state the conversion you used and where it came from.

3

Price the plate 40 MINUTES**Work out what one plate cost in rupees from prices actually paid, not from memory.**

- Collect the shop receipts, and where there are none walk to the shop and write the current price per kilogram for each item on a card.
- Ask whoever shops where each item was bought and write the shop name beside the price.
- Divide each price per kilogram by one thousand and multiply by the grams on the plate, in a formula cell, to get rupees per item.
- Add cooking fuel as a single line, marked clearly as an estimate, with the reason for the estimate written next to it.

WRITE THIS DOWN

Rupees per item per plate, the shop each price came from, and the total rupees for one plate.

DONE WHEN

The plate total is one rupee figure and every price behind it traces to a receipt or a shop visit recorded in the log.

Watch out. Using online supermarket prices for food bought at a street market. Use what your household actually paid, and where you cannot recover it, say so beside the number.

4

Find the litres 60 MINUTES**Look up the published water footprint per kilogram for each item and convert it to litres on your plate.**

- Open the Water Footprint Network product gallery and search each ingredient by name, one at a time.
- Where an ingredient is missing there, use the freshwater-use-per-kilogram table on Our World in Data's 'Environmental Impacts of Food Production' page.
- Copy the figure, its units and the page title into the source column - a number with no source beside it is struck out at marking.
- Multiply litres per kilogram by kilograms on the plate inside a formula cell, so a stranger can see the arithmetic rather than trust it.
- Sort the sheet by litres, then write one line, in the source's own words, on what the coefficient includes and excludes.

WRITE THIS DOWN

Litres per item, the total litres for one plate, and the exact source line beside every coefficient.

DONE WHEN

You can name the single item carrying the biggest share of the litres and open the page the figure came from.

Watch out. Treating a published coefficient as the truth for your district. These are national or global averages - write that limit down now, because the defence will ask for it.

5

Weigh the waste 45 MINUTES SPREAD OVER SEVEN DAYS**Measure the food from this household thrown away over one week and attach its full footprint to it.**

- Keep one bowl by the sink for seven days; after every meal scrape uneaten food into it and weigh it before it goes in the bin.
- Weigh anything thrown out uncooked from the fridge as well, item by item, and write the reason it was thrown.
- Apply the same litres-per-kilogram coefficient to the wasted mass, because the water was already spent before the food was binned.
- Add two rows to the sheet: grams wasted this week and litres of water thrown away this week.

WRITE THIS DOWN

Grams wasted each day for seven days, the reason for each, and the week's litres-wasted total.

DONE WHEN

Seven daily waste figures exist, including the days that were zero, and the weekly litres figure sits in the same sheet.

Watch out. Leaving the cell empty on a day nothing was wasted. A zero is a measurement; an empty cell is a hole in the week.

6 Name the cost 50 MINUTES

Finish the costed problem statement on one page and choose the single change you will make.

- Write four lines: whose problem this is, litres per plate, rupees per plate, and litres and rupees per year at this household's real frequency.
- Build one Datawrapper bar chart of litres per item, largest bar first, titled with the finding rather than with the word 'chart'.
- List three possible changes - swap an ingredient, cut a portion, change where an item is bought, stop one form of waste - with the litres each would save on paper.
- Choose one and write the sentence: 'I will change X to Y for three weeks and expect litres per plate to fall from A to B.'
- Show the page to whoever cooks and record their agreement as a dated note or a voice message before anything changes.

WRITE THIS DOWN

The one-page costed problem statement, the three candidate changes with predicted savings, and the chosen change as one testable sentence.

DONE WHEN

Somebody who was not there reads the page once and repeats your litres number back correctly.

Watch out. Choosing the change that saves most on paper but nobody at home will accept. A change abandoned in week one measures nothing - choose the one that survives.

7 Agree the rules 40 MINUTES

Write the protocol that keeps the after-measurement identical to the before-measurement.

- Write what stays fixed: same dish, same scale, same number of people, same shops, same weighing point in the cooking.
- Write what is allowed to move: only the one thing you named in step six.
- Put the three cooking dates in a shared calendar and tell everyone who eats the meal.
- Add three blank labelled rows to the sheet for weeks one, two and three before any data exists.
- Record a thirty-second voice note stating your prediction, and file it with today's date on it.

WRITE THIS DOWN

The protocol as a numbered list, the three dates, and the timestamped prediction.

DONE WHEN

The sheet holds empty labelled rows waiting for three weeks, and the prediction exists before the data does.

Watch out. Deciding the measurement rules after seeing week one. Anything rewritten once data exists goes in the failure log with the date it was rewritten.

8 Measure week one 45 MINUTES

Cook the meal with the change in place and measure exactly the quantities you measured before.

- Weigh every raw item again in grams per person, using the same scale and the same divisor.
- Record the prices paid this week rather than reusing the Act 1 prices.
- Apply the same coefficients from the same sources - do not change source in the middle of an experiment.
- Weigh this meal's waste into the same bowl and add it to the running count.
- Write down what went wrong: a substitute ingredient, an extra guest, a forgotten weighing.

WRITE THIS DOWN

The week one row complete - grams, rupees, litres, waste - plus a dated failure entry.

DONE WHEN

Week one has every column the baseline had, and the failure log holds at least one honest entry.

Watch out. Deleting the row for the ingredient you swapped away instead of entering zero. Enter the zero; the comparison depends on the same rows existing in both periods.

9

Weeks two and three 60 MINUTES ACROSS TWO WEEKS**Repeat the identical measurement twice more and compare all three weeks against the baseline.**

- Cook and measure on the two booked dates without changing anything except what the protocol allows.
- Calculate the mean litres per plate across the three after-weeks and set it against the baseline plate.
- Chart baseline against weeks one, two and three in Datawrapper as four bars on one axis, in litres per plate.
- List every confounder you can name: guests, a price rise, an ingredient out of stock, a different cook, a different appetite.
- State the change as a number and as a percentage, and state plainly whether three measurements are enough to be sure.

WRITE THIS DOWN

The four-bar chart, the mean after-figure, the difference in litres and in rupees per year, and the confounder list.

DONE WHEN

You can state the before number, the after number, and at least two reasons the difference might not be your doing.

Watch out. Reporting the best of the three weeks. Report all three, including the week that went backwards - a well-measured failure outscores an unmeasured success.

10

Share and reflect 60 MINUTES**Publish the finding, defend it to real people, and record what the household will keep.**

- Record a defence video of no more than three minutes: the plate, the litres, the sources, the change, the result and the limits.
- Show the one-page explainer to three people who eat this meal and write down what each of them said.
- Send the chart to the expert you interviewed with one question: what would you have measured that I did not.
- Ask the household on camera whether the change stays and why, and let them answer without prompting.
- Complete the relations ledger with ten names, roles, dates and what each person replied.

WRITE THIS DOWN

The defence video, the one-page explainer, and the relations ledger holding ten logged relationships.

DONE WHEN

Ten relationships are logged with dates and replies, and the household has said on record whether the change stays.

Watch out. Calling it a success because the household said they liked it. The metric is litres and rupees - report those first and opinions second.

Your nine deliverables in this project**1 - RESEARCH - WEEK 2****Question card**

One card naming the dish, the household and the number of eaters, and the question: how many litres and rupees stand behind one plate of this, and which item carries most.

2 - OUTREACH - WEEK 3**Expert interview pack**

Five written questions for an agronomist or irrigation engineer, your plate figures attached as one page, the date and channel of the request, and the reply recorded word for word.

3 - RESEARCH - WEEK 4**Evidence log**

Every weighing in grams with its date, every price with the shop it came from, and every litres-per-kilogram coefficient with the exact source line beside it. Nothing unsourced survives here.

4 - PROCESS - WEEK 5**Failure log**

The weighings you missed, the ingredient substituted mid-experiment, the week the swap was abandoned, the guest who doubled the pot, and what each of them did to the comparison, all dated.

5 - DESIGN - WEEK 5**The build**

The measuring set-up itself - scale, waste bowl, ruled table or sheet - together with the four-bar comparison chart of litres per plate, baseline against the three after-weeks, on one axis.

6 - DESIGN - WEEK 5**One-page explainer**

One page a neighbour reads in ninety seconds: the dish, the litres, the rupees per year, the one change, the three-week result, and what this figure cannot tell anybody.

7 - BRANDING - WEEK 5

Identity card

A name and a one-line promise for the measurement, so the household can refer to it by name, plus the single sentence you want repeated at somebody else's dinner table.

9 - DEFENCE - WEEK 6

Defence video

Under three minutes on camera: the plate, the litres figure, the source of every coefficient, the one change, the three-week result, and the limits you accept without argument.

8 - OUTREACH - WEEK 6

Relations ledger

Ten names with dates and replies: one agronomist, three people who eat this meal, three peers who checked your arithmetic, and three people you sent the chart to who answered.

The four tiers, in this project

Starter

You weigh one plate, price it from real receipts, look up every litres-per-kilogram figure with its source written beside it, and put your questions to one stranger who works with crops.

Researcher

You write the protocol before the first weighing, justify three after-weeks rather than one, and quantify the error your scale, your per-person divisor and globally averaged coefficients introduce.

Practitioner

You choose which meal to measure and defend the choice, cite every borrowed figure to its page, and produce one chart a stranger reads correctly without you explaining the axes.

Contributor

You set your plate figure against a published water-footprint study, defend your method to an agronomist who disagrees, and publish your raw weighings and every source openly so others can recompute it.

The one expert you must talk to

Who. An agronomist, irrigation engineer or agricultural extension officer - somebody who decides how much water a crop actually gets. A rice mill manager or a dairy farm manager works equally well.

Where to find one. Ring the district agriculture extension office listed on the provincial agriculture department site. Agricultural university departments publish staff emails. Search LinkedIn for 'agronomist' plus your city. Failing all three, the manager of a rice mill, a dairy or a vegetable wholesale market will know the water figures for their own crop.

SEND EXACTLY THIS

Hello, my name is [name]. I have weighed one dinner my family ate and worked out the litres of water behind it from published per-kilogram figures. One of my numbers looks wrong to me. Could you spare fifteen minutes on the phone this week to tell me which one? I will send my five questions first.

Ask them

1. For the crop you know best, how many litres of water reach one kilogram at the farm gate, and how do you know that figure?
2. Published water footprints are national averages. How far off would that average be for a field in this district, and in which direction?
3. Which of the ingredients on my plate would you say is the most water-expensive, before I show you my numbers?
4. When a farmer changes one practice, how long before the change shows up in water use, and how is it measured?
5. If a buyer asked you to prove a shipment's water footprint tomorrow, what evidence would you actually send them?

You will be asked, without warning

1. Would this drop in litres have happened anyway without your change, and how do you know?
2. Your litres-per-kilogram figures are averages taken somewhere else. What would the figure be for the field that actually grew your rice, and how would you find that out?
3. You measured three weeks. Convince me three is enough, and tell me what a fourth week would most likely have shown.
4. If the household goes back to the old ingredient next month, what was this project worth, in litres and in rupees?

If you get stuck

- If nobody replies to your interview requests - then stop writing and go to the vegetable wholesale market at opening time and ask one trader two questions while they work.
- If your before and after look the same - then report that as the finding, check first whether the change was actually kept on every one of the twenty-one days, and write what you find in the failure log.
- If you cannot weigh an item - then measure it by level cupfuls, weigh one cupful once on a shop's scale, write that conversion at the top of the page, and mark the row as estimated.
- If you run out of time - then shorten the after-period to two weeks rather than dropping the baseline, and state the shortened period on the chart itself.

Finished early?

Measure the same dish cooked in a second household and set the two plates side by side, item by item, on one chart.

The Sugar You Did Not Order

Seven days of drinks, converted to level teaspoons: the sugar your household never ordered and never saw.

THE QUESTION

How many level teaspoons of sugar does your household drink in one week, and which single drink carries most of them?

Sugar in drinks is a product decision made by manufacturers and tea stalls, and it is measured in grams per hundred millilitres on a label that almost nobody reads. Governments in a growing number of countries now tax or regulate sugar in beverages, and manufacturers reformulate recipes in response, so the work of converting labels into an honest household total is done professionally by dietitians, public-health analysts and product teams. The method here is theirs: a defined population, a fixed observation window, a published composition figure per unit, a stated conversion, and a plain account of what the total leaves out.

ACT 1 - FIND

You count what your household drinks, not what it eats. Every drink taken by every person over seven days is logged by volume, the grams of sugar per hundred millilitres are read off the label where there is one, the sugar spooned in at home is weighed or counted in level teaspoons, and the whole week is converted into one number: level teaspoons of sugar drunk.

A one-page costed problem statement carrying four lines: which household, level teaspoons of sugar drunk in the week, the same figure projected across a year, and the rupees spent on those drinks in the week. Beside it sits a bar chart of teaspoons by drink type, largest bar first, with the source of every sugar figure named and the four-gram conversion stated on the page.

ACT 2 - FIX

You swap exactly one drink - one item, not all of them - agreed in advance with whoever drinks it, and you leave everything else in the household untouched. Seven days later you count the identical seven days the identical way, using the same log, the same labels and the same conversion, so the only moving part is the one swap you named.

A two-bar chart of level teaspoons per household per week, baseline against swap week, with the difference in teaspoons and in rupees, the swapped drink's own before-and-after line shown separately, a named list of confounders, and the household's recorded answer on whether the swap stays.

YOU MEASURE

level teaspoons of sugar drunk by the household in one week

BEFORE

Seven consecutive days of logging every drink taken by every person by volume in millilitres, multiplied by the grams of sugar per hundred millilitres printed on the label or taken from a named open database, plus sugar added at home weighed on a kitchen scale or counted in level teaspoons, all divided by the grams in one level teaspoon to give teaspoons. Taken before anything is swapped.

AFTER

The same seven weekdays logged the same way one week later, by the same people, with the same log sheet, the same label figures and the same teaspoon conversion, reported as a whole-household total with the swapped drink also shown on its own line.

Safety and ethics - not optional

- This project counts what is drunk and nothing else. Nobody is weighed, nobody is measured, no calories are counted, and no remark about anyone's size, shape or appearance goes in the log, the chart, the explainer or the video. There are no diets, no targets and no use of the word should. Say plainly on the front page that this is a study of a product and a habit, never of a person's body.
- Nobody is named anywhere, including members of your own family. Use adult 1, adult 2, person 3 in the log and use the same labels in the write-up, the chart and the defence video. Anybody may refuse to be logged at the start and anybody may withdraw at any point without giving a reason; when they do, their rows stop, the row is marked withdrawn with the date, and nothing already recorded is used against them.
- If anyone being logged looks uncomfortable, goes quiet about it, or says they would rather not, stop logging that person immediately and write it in the failure log as a recorded event with the date. A household total taken from fewer people is a real finding reported with its limits; a total taken from someone who did not want to be counted is not.
- Nobody is denied a drink at any point, in either week. The swap in Act 2 is one drink, agreed in advance with the person who drinks it, and either of you can end it. Weigh dry sugar cold, in a bowl on the scale, and do not prepare extra drinks for the project.

WHAT YOU USE - HIGH-TECH ROUTE

Google Sheets, or LibreOffice Calc where there is no account - the seven-day drinks log, the grams-to-teaspoons conversion, and the weekly totals in visible formula cells

Open Food Facts (openfoodfacts.org) - an open, free-to-search database of packaged drinks giving sugars per hundred millilitres for any bottle whose label is missing, damaged or in a language you cannot read

USDA FoodData Central (fdc.nal.usda.gov) - free public composition data for unpackaged drinks such as fresh juice, plain milk and yoghurt drinks, searched without an account

The chart editor built into your spreadsheet - the teaspoons-by-drink bar chart and the two-bar baseline-against-swap-week comparison, with no second tool and no second login

Google Docs, or any plain text editor - the evidence log, the one-page explainer and the interview pack

The phone camera and a dated folder in Google Drive - photographs of every nutrition label and every scale reading, so each figure can be checked by somebody who was not there

The whole project runs in a browser and a kitchen: a free spreadsheet holds the seven-day log and does the arithmetic in visible formula cells, open nutrition databases fill in any drink whose label is missing, and the spreadsheet's own chart tool draws the result.

Act 1 – find the problem steps 1 to 5, ending with a costed problem statement

1 Set the rules 40 MINUTES

Agree who is being logged, on what terms, and build the empty log before a single drink is counted.

- Sit the household down together and read out one sentence: this counts drinks, not people, nobody is weighed and nobody is named.
- Give each person a label - adult 1, adult 2, person 3 - write the labels on a card, and tell everyone they may stop being logged at any time without saying why.
- Open a Google Sheets file named 'The Sugar You Did Not Order' with columns: date, time, person label, drink, millilitres, sugar grams per hundred millilitres, spoons added, source, grams, teaspoons.
- Write the seven dates of the baseline week into the sheet now, one block per day, including the days you expect to be quiet.
- Type the sentence 'this project is about a product and a habit, never about a person's body' into cell A1 and leave it there for the whole project.

WRITE THIS DOWN

The person labels with no names beside them, the seven dates, the empty column headings, and one line recording that everyone agreed and how they were told they could withdraw.

DONE WHEN

The sheet exists with seven dated day blocks and zero rows of data, and every person being logged can say in their own words how they would stop.

Watch out. Starting the log first and asking permission afterwards. Permission collected after the fact is not permission, and a household that feels watched changes what it drinks before you have measured anything.

2 Log seven days 20 MINUTES A DAY FOR SEVEN DAYS

Record every drink taken by every logged person for seven consecutive days, by volume.

- Keep the sheet open on a phone in the kitchen and enter each drink within a few minutes of it being poured, not at the end of the day from memory.
- Measure the household's usual cup, glass and bottle once with a marked jug, write the millilitres of each on a card taped inside a cupboard door, and log by vessel afterwards.
- Log everything with sugar in it or on it: tea, coffee, soft drinks, packaged and fresh juice, flavoured milk, lassi, squash, cordial, energy drinks, sweetened yoghurt drinks and sweetened lemonade.
- Log drinks taken outside the house too, marked with the letter O, and log plain water and unsweetened tea as zero rows so the week is complete.
- At the end of each day type a single line saying whether anything was missed and roughly how much.

WRITE THIS DOWN

One row per drink with date, time, person label, drink, millilitres and where it was drunk, plus a nightly completeness note.

DONE WHEN

Seven consecutive days each carry at least one row, no day is blank, and the daily completeness notes exist including the ones admitting misses.

Watch out. Reconstructing three days on Sunday evening. Memory undercounts drinks badly, especially tea. Log at the kettle, and where you did reconstruct, mark those rows as reconstructed rather than pretending.

3

Read the labels 50 MINUTES**Get grams of sugar per hundred millilitres for every packaged drink in the log, from the label itself where possible.**

- Collect every bottle, carton, tin and sachet from the week, including empties from the bin, and lay them out on the counter.
- Photograph each nutrition panel close enough to read, and file the photographs in a dated Drive folder named after the drink.
- Copy the sugars figure per hundred millilitres into the sheet, and where the panel gives per serving instead, divide by the serving size in millilitres and multiply by a hundred inside a formula cell.
- For any bottle with no readable panel, search Open Food Facts by product name or barcode and paste the page title into the source column beside the number.
- For fresh juice, plain milk or a yoghurt drink with no packet, take the figure from USDA FoodData Central and name the entry you used.

WRITE THIS DOWN

Sugar grams per hundred millilitres for every packaged drink, the exact source beside each one, and a photograph reference for every label read.

DONE WHEN

Every packaged drink in the log has a sugar figure with a source, and a stranger could open the photograph or the database page behind any one of them.

Watch out. Copying the per-serving figure into the per-hundred-millilitres column. A serving is often more than a hundred millilitres and sometimes far less; convert it in a visible formula cell rather than in your head.

4

Weigh the spoons 45 MINUTES**Measure the sugar added at home, which no label will ever tell you.**

- Put a small bowl on a kitchen scale, zero it, add ten level teaspoons of sugar counted out loud, weigh the total, divide by ten, and write the grams in one level teaspoon at the top of the sheet.
- Where there is no scale, use four grams for one level teaspoon and write on the page that this is a standard figure you did not measure yourself.
- Watch the tea being made for three days and count the level teaspoons that go in, asking whoever makes it to spoon as normally as they can while you count.
- Where sugar goes into a shared pot, count the spoons into the pot, count the cups poured out of it, and divide in a formula cell so the division can be checked.
- Photograph the scale display showing the ten-spoon weight and file it with the label photographs.

WRITE THIS DOWN

Grams in one level teaspoon as measured by you, the spoons added per cup for each home-made drink, the pot divisor where one applies, and a note against anything estimated rather than counted.

DONE WHEN

Every home-made drink row in the log carries a spoons-added figure, and the grams-per-teaspoon figure on the sheet came from your own scale or is openly marked as a borrowed standard.

Watch out. Counting heaped spoons as level ones. A heaped spoon can hold close to twice a level one. Level them against the rim, or weigh a heaped spoon once and use that weight instead.

5

Convert to teaspoons 50 MINUTES

Turn the whole week into one number anybody understands: level teaspoons of sugar drunk.

- In a formula cell, multiply millilitres by grams per hundred millilitres and divide by a hundred to get grams of sugar for each packaged drink row.
- For home-added sugar, multiply spoons by the grams in one level teaspoon, and add both figures where a drink has label sugar and spooned sugar.
- Divide every grams figure by the grams in one level teaspoon to give teaspoons per row, and sum the column for the week.
- Build three totals with the spreadsheet's SUMIF: teaspoons for the week, teaspoons by drink type, and teaspoons by person label.
- Draw the teaspoons-by-drink bar chart with the spreadsheet chart editor, largest bar first, and title it with the finding rather than with the word chart.

WRITE THIS DOWN

Teaspoons per row, the week's household total, the breakdown by drink type and by person label, and the chart.

DONE WHEN

You can say the household's weekly teaspoon total out loud without looking, and name the single drink carrying the biggest share of it.

Watch out. Reporting one enormous grams figure. Grams mean nothing at the dinner table and teaspoons mean everything. Convert, and put the conversion you used on the same page as the number.

Act 2 – fix it and measure steps 6 to 10, ending with a proven effect

6

Name the cost 50 MINUTES

Finish the costed problem statement on one page and choose the single drink you will swap.

- Write four lines: which household and how many people, level teaspoons drunk this week, the same figure multiplied out across a year, and the rupees the week's drinks cost from receipts or shop prices.
- Put the teaspoons-by-drink chart on the same page with the four-gram-per-teaspoon conversion printed under it.
- List three possible swaps with the teaspoons each would save on paper: replace one packaged drink with water or unsweetened tea, halve the spoons in one home-made drink, or change one bottle size.
- Choose one, and only one, and write the sentence: 'For one week we will swap X for Y and expect the household total to fall from A teaspoons to B.'
- Read the page to the person who actually drinks that drink, ask them to agree or refuse, and record their answer and the date before anything changes.

WRITE THIS DOWN

The one-page costed problem statement, the three candidate swaps with predicted savings, the chosen swap as one testable sentence, and the dated agreement of the person affected.

DONE WHEN

Somebody who was not there reads the page once and repeats the teaspoon number back correctly, and the person whose drink changes has agreed on the record.

Watch out. Swapping everything at once because the total looks bad. Swap one drink. Change five and you will never know which one moved the number, and the household will abandon all five by Wednesday.

7

Agree the protocol 40 MINUTES**Write down what must stay identical in the second week so the two weeks can be compared at all.**

- Write what is fixed: same seven weekdays, same people and labels, same cups and vessels, same log sheet, same label figures, same grams per teaspoon.
- Write what is allowed to move: only the one drink named in step six.
- Add seven blank dated day blocks to the sheet for the swap week before any data exists, and tell everyone which day it starts.
- Buy or prepare the replacement drink before day one, so nobody is stuck without a choice at the moment of habit.
- Type your prediction into the sheet with today's date and time on it, and leave it visible.

WRITE THIS DOWN

The protocol as a numbered list, the seven swap-week dates, and the timestamped prediction.

DONE WHEN

The sheet holds seven empty labelled day blocks and a prediction that plainly predates the data.

Watch out. Running the swap week in a week that is not normal - a holiday, a wedding, guests, exams. Pick an ordinary week, and if the week turns out not to be ordinary, write that down rather than hiding it.

8

Run the swap 20 MINUTES A DAY FOR SEVEN DAYS**Log the swap week exactly as you logged the baseline week, changing nothing else.**

- Enter every drink at the kettle again, in the same columns, with the same person labels.
- Log the replacement drink as its own row with its own label figure or spoon count, rather than entering a zero and moving on.
- Log the swapped drink as zero on the days it did not happen, and log it honestly on any day it came back.
- Write one line each evening on how the swap held: kept, partly kept, or abandoned, and why.
- If anyone asks to stop being logged, stop that person's rows the same minute, mark them withdrawn with the date, and carry on with the rest.

WRITE THIS DOWN

Seven complete swap-week days, the daily kept-or-broken line, and any withdrawal recorded with its date.

DONE WHEN

The swap week has every column the baseline week had, and the failure log holds at least one honest entry about a day the swap slipped or a drink went unrecorded.

Watch out. Quietly not logging the day the old drink came back. That day is the most informative day in the fortnight. Log it, and say what happened just before it.

9

Compare the weeks 50 MINUTES**Set the two weeks side by side and report the difference honestly, including if there is none.**

- Total the swap week in teaspoons the same way and put the two totals side by side in the sheet.
- Draw the two-bar chart, baseline against swap week, in level teaspoons per household per week, on one axis with the scale starting at zero.
- Draw the swapped drink on its own second chart, so a reader can see whether the swap worked and the total still did not move.
- List every confounder by name: a guest, a hot week, a fast, an illness, a person withdrawing, a price change, somebody drinking more of something else instead.
- State the change as teaspoons and as a percentage, and write one plain sentence on whether one week either side is enough to be sure.

WRITE THIS DOWN

The two-bar chart, the swapped-drink chart, the difference in teaspoons and in rupees, and the named confounder list.

DONE WHEN

You can state the before number, the after number, and at least two reasons the difference might not be your doing.

Watch out. Explaining away a week that went the wrong way. Report it. A well-measured failure outscores an unmeasured success, and substitution - more of something else - is the finding a dietitian will most want to hear.

10

Share and reflect 60 MINUTES**Publish the finding, defend it to real people, and record what the household will keep.**

- Record a defence video of no more than three minutes: the log, the teaspoon total, the sources, the one swap, the result and the limits, with no name and no person on camera.
- Show the one-page explainer to three people who drink these drinks and write down what each of them said.
- Send the two-bar chart to the expert you interviewed with one question: what would you have counted that I did not.
- Ask the household, without prompting them, whether the swap stays, and record the answer in their own words using labels rather than names.
- Complete the relations ledger with ten names, roles, dates and what each person replied.

WRITE THIS DOWN

The defence video, the one-page explainer, and the relations ledger holding ten logged relationships.

DONE WHEN

Ten relationships are logged with dates and replies, no person is named or pictured in anything published, and the household has said on record whether the swap stays.

Watch out. Ending with advice about what people should drink. You measured a product and a habit for two weeks. Report the number, report the limits, and let the household decide.

Your nine deliverables in this project**1 - RESEARCH - WEEK 2****Question card**

One card naming the household size, the seven dates and the person labels, and the question: how many level teaspoons of sugar does this household drink in a week, and which drink carries most.

2 - OUTREACH - WEEK 3**Expert interview pack**

Five questions for a dietitian, school nurse, pharmacist or beverage-shop owner, your weekly teaspoon total attached as one page with no names, the date and channel of the request, and the reply word for word.

3 - RESEARCH - WEEK 4**Evidence log**

Every drink row with date, time, person label and millilitres, every sugar figure with the label photograph or database page behind it, your measured grams per level teaspoon, and every spoon count with its date.

4 - PROCESS - WEEK 5**Failure log**

The drinks logged from memory, the days the swap broke and why, anyone who withdrew and when, the label you could not read, and what each of them did to the comparison, all dated.

5 - DESIGN - WEEK 5**The build**

The logging system itself - the wall sheet or spreadsheet, the marked cups, the weighed teaspoon - together with the two-bar comparison chart of teaspoons per household per week, baseline against swap week.

6 - DESIGN - WEEK 5**One-page explainer**

One page a neighbour reads in ninety seconds: the teaspoon total, the drink that carried most, the one swap, the second week's total, and what this figure cannot tell anybody about anybody's health.

7 - BRANDING - WEEK 5**Identity card**

A name and a one-line promise for the measurement so the household can refer to it by name, plus the single sentence you want repeated at somebody else's table, carrying the number and no judgement.

8 - OUTREACH - WEEK 6**Relations ledger**

Ten names with dates and replies: one dietitian, nurse, pharmacist or shopkeeper, three people affected by the drinks bill, three peers who checked your arithmetic, and three people you sent the chart to who answered.

9 - DEFENCE - WEEK 6**Defence video**

Under three minutes on camera with no person in shot and no name spoken: the teaspoon total, the source of every sugar figure, the one swap, the result, and the limits you accept without argument.

The four tiers, in this project

Starter

You log seven days without missing a drink, read the sugar figure off at least five labels, weigh one level teaspoon, produce a weekly teaspoon total, and question one stranger who works with food.

Practitioner

You decide which drinks count and defend the boundary, cite every sugar figure to the label or database page it came from, and produce one chart a stranger reads correctly without you explaining the axes.

Researcher

You write the log protocol before day one, justify a seven-day window rather than three days, and quantify the error introduced by unlabelled drinks, shared pots and drinks taken outside the house.

Contributor

You set your household figure against a published survey of beverage sugar intake, defend your method to a dietitian who disagrees, and publish the anonymised daily log openly so anybody can recompute your total.

The one expert you must talk to

Who. A dietitian or nutritionist in a hospital or clinic, a school nurse, a community pharmacist, or the owner of a busy tea stall, juice bar or beverage shop who knows exactly how much sugar goes into a day's takings.

Where to find one. Walk into a pharmacy at a quiet hour and ask whether the pharmacist has fifteen minutes later in the week. Hospitals and clinics list a dietetics or nutrition department on their website with a reception number. Search LinkedIn for 'dietitian' or 'nutritionist' plus your city. For the trade side, the tea stall or juice bar nearest your house buys sugar by the sack and will tell you how much a week if you ask while they are not busy.

SEND EXACTLY THIS

Hello, my name is [name]. I logged every drink my household took for seven days and converted the labels into teaspoons of sugar. The weekly total surprised us and I think I have counted something wrong. Could you spare fifteen minutes this week to tell me which part? I will send five questions first.

Ask them

1. When you count sugar from drinks, what do you count and what do you deliberately leave out?
2. How far off is a household's own seven-day log likely to be, and does it usually undercount or overcount?
3. Which drink in a normal week do people most often forget to mention to you, and why that one?
4. When somebody changes one drink, what usually happens to the rest of what they drink, and how would I detect that in my log?
5. If you had my seven days of data, what one extra column would you have asked me to record?

You will be asked, without warning

1. Would the second week's total have fallen anyway without your swap, and how do you know?
2. Your figures come from labels and from spoons you counted. Which of the two do you trust less, and what would it take to check it?
3. Somebody in the household drank more of something else during the swap week. Show me where in your data you would see that, or explain why you could not.
4. You logged seven days. Convince me seven is enough, and tell me what an eighth week of the year would most likely have looked like.

If you get stuck

- If nobody replies to your interview requests - then stop writing and walk to the busiest tea stall or juice bar near you at a quiet hour and ask the owner two questions while they work.
- If your baseline and swap weeks look the same - then report that as the finding, check the daily kept-or-broken lines to see whether the swap was actually held on all seven days, and look for a drink that grew while the swapped one shrank.
- If a drink has no label and no database entry - then measure it directly: count the spoons that went into the pot, count the cups poured out, divide, and mark the row as measured rather than sourced.
- If you run out of time - then keep both weeks at seven days and cut the number of drinks you cover rather than the number of days, and state on the chart exactly which drinks were excluded and why.

Finished early?

Log a second household of a different size for the same seven days and put the two weekly totals side by side per person, still using labels and no names.

The Prayer-Time Error

Time the sunset from your own doorstep for fourteen evenings and find how many minutes your timetable is out.

THE QUESTION

How many minutes does the printed or app timetable differ from the event you actually see from one fixed spot, and where does that difference come from?

A published time is the output of a model, and the moment you see is an observation; the gap between the two is exactly what positional astronomy exists to account for. Surveyors, satellite operators, flight planners and anybody who publishes an almanac are paid to know the size of that gap, its causes and its limits. The method here is theirs: fix a station, synchronise a clock, observe repeatedly, and report the residual with its spread instead of one confident number.

ACT 1 - FIND

You stand on one marked spot for fourteen evenings and record, to the minute against a clock synchronised to network time, the moment the sun leaves your horizon. You set that observation against what the wall calendar says, what the app says, and what an astronomical computation says for your exact coordinates.

A one-page costed problem statement carrying four lines: whose problem this is, the mean signed difference in minutes at this spot, the worst evening in the fortnight, and the total minutes of mistiming per year across everyone who uses that same table here. Beside it sits a chart of the signed difference against date with a line at zero, the source and stated location of every published time, and one line stating that this is an observation of visibility from one spot and not a religious ruling.

ACT 2 - FIX

You publish a corrected table for that one spot, built by applying your measured offset to the computed times, with its evidence and its limits printed on the same page. You then put it in the hands of at least five people, observe fourteen more evenings against it, and count use in user-days recorded by the users themselves.

The residual difference in minutes between the corrected table and fourteen fresh observations, the adoption count in user-days backed by tick sheets or message threads rather than memory, and every user's answer to the same two questions written word for word, including the answers of those who stopped.

YOU MEASURE

minutes between the published time and the event observed from one fixed spot

BEFORE

Fourteen consecutive evenings observed from one chalk-marked spot at one marked eye height, each read to the minute from a clock checked against network time, subtracted from the printed calendar time, the app time and the computed time for the same date. Reported as a mean with its largest and smallest value, cloudy evenings marked unusable rather than filled in.

AFTER

Fourteen further evenings observed from the identical spot, at the identical eye height, with the identical clock check, subtracted from the corrected table you published. Reported the same way, alongside the count of user-days recorded by the five or more people using the table.

Safety and ethics - not optional

- Never look at the sun. Not with the naked eye, not through a phone or camera screen, not through glasses, sunglasses, binoculars, a telescope or any lens. Keep your eyes on the wall top, the ridge or the horizon edge and note the moment the light leaves that edge.
- Observe from a window, a courtyard or a roof that has a wall or a railing. An adult in the household knows which spot you stand on and at what time. Never observe alone from an unlit street, an open plot or an unfenced roof edge.
- This project measures visibility from one spot. It is not a religious ruling. Write on every page you publish that this is an observation and not a verdict, and that questions of religious practice belong to a qualified scholar.
- Take nothing to the observation spot that you would not want to drop: no glass, no borrowed phone held over a parapet, no chair dragged to the edge to see further. If the view needs a climb, choose a different spot.

WHAT YOU USE - HIGH-TECH ROUTE

Stellarium Web (stellarium-web.org) - the computed sunset or sunrise time for the exact coordinates of your observation spot

time.is - a clock synchronised to network time, reporting your device's offset in seconds so the clock itself is evidence

OpenStreetMap (openstreetmap.org) - the latitude and longitude of your spot to five decimal places, read off the building you stand in

Google Sheets - the fourteen-day observation log, the signed difference columns and the mean and range in visible formula cells

Datawrapper, free plan - the chart of signed difference in minutes against date, with a line at zero

Google Docs - the corrected local table, the one-page explainer and the interview pack

Everything runs in a browser and on one doorstep: a free planetarium site supplies the computed event for your coordinates, a network-time page proves the clock, and a free spreadsheet holds fourteen evenings of observation.

Act 1 – find the problem steps 1 to 5, ending with a costed problem statement

1 Fix the spot 45 MINUTES

Choose one spot you can stand on every evening for a month and fix it so it never moves.

- Stand where you can see the western skyline from a window, a courtyard or a walled roof, and check that an adult in the household can see or hear you there.
- Mark the standing position with chalk and tape a card at your eye height on the frame beside you, so height as well as position is fixed.
- Open OpenStreetMap, find the building, and copy the latitude and longitude to five decimal places into your sheet.
- Photograph the western skyline from the mark and draw over the photograph the wall top, ridge or roof line the sun goes behind.
- Write one line on what blocks the true horizon and roughly how high it stands above your eye height.

WRITE THIS DOWN

The coordinates, a description of the spot, the eye-height mark, and the skyline photograph with the blocking edge drawn on it.

DONE WHEN

Another person can stand on your chalk mark, put their eyes at the taped height, and see the same skyline as your photograph.

Watch out. Stepping half a metre aside because the view is better. A different standing point puts a different edge in the way and moves the moment of disappearance; mark the spot and keep it.

2 Prove the clock 30 MINUTES

Get a clock you can trust to the second and record the evidence that it is trustworthy.

- Open time.is on the device you will read each evening and let it report the offset between that device and network time.
- If the device is more than two seconds out, correct it in the settings, reload the page, and photograph the reading showing the corrected offset.
- Write the device name, the offset in seconds and the date into the sheet, and repeat this check on the first evening of each week.
- Agree the rules aloud with an adult in the household: which spot, which time, and that you never look at the sun or use any lens.

WRITE THIS DOWN

The device, the measured offset in seconds, the date of every check, and the agreed observation slot.

DONE WHEN

A dated photograph shows the clock within two seconds of network time, and one adult knows where you stand and when.

Watch out. Reading the time off a wall clock nobody has set this year. An argument decided by minutes cannot be settled by a clock that is four minutes out.

3

Read the tables 50 MINUTES

Record what the printed calendar, the app and an astronomical computation each state for your fourteen dates.

- Photograph the wall calendar or printed timetable page covering the next fourteen days, so the source is fixed and cannot be edited later.
- Write the app's name and version, then copy its stated time for each of the fourteen dates into the sheet.
- Open Stellarium Web, set the location to the coordinates from step one, and read the computed time for each of the same dates.
- Write down which city, zone or point each printed source says it was computed for; where it does not say, write 'not stated'.
- Build the columns: date, calendar time, app time, computed time, observed time, difference in minutes, sky condition.

WRITE THIS DOWN

Fourteen dated rows carrying three published times each, with the name and stated location of every source beside it.

DONE WHEN

All fourteen dates carry a calendar time, an app time and a computed time, and every source is named on the page.

Watch out. Assuming the app and the calendar agree and copying only one. Copy both; the gap between two published tables is a finding on its own.

4

Watch fourteen evenings 20 MINUTES EACH EVENING FOR FOURTEEN EVENINGS

Observe the actual moment from the fixed spot for fourteen evenings and record it to the minute.

- Stand on the chalk mark ten minutes before the printed time, with an adult in the household knowing you are there.
- Keep your eyes on the wall top, ridge or horizon edge and never on the disc itself, and use no phone screen, camera, glasses or lens of any kind.
- Note the minute the last light leaves that edge, reading the clock you proved in step two.
- Write or photograph the clock reading immediately, before you step off the mark.
- Record the sky in three words - clear, hazy, cloud on the horizon, dust - and mark any evening you could not see the edge as unusable rather than guessing.

WRITE THIS DOWN

Fourteen dated observed times to the minute, the sky condition for each, and a clear mark against every evening lost to weather.

DONE WHEN

At least ten usable evenings carry an observed time, and every unusable evening is written down as unusable rather than left blank.

Watch out. Filling in a cloudy evening from the app so the row looks complete. A missing observation is data; an invented one destroys the whole table.

5

Work out the error 55 MINUTES**Calculate the signed difference in minutes against each published source and describe how it behaves.**

- Subtract the calendar time from the observed time for every usable date in a formula cell, keeping the sign so early and late stay apart.
- Repeat against the app time and against the computed time, giving three difference columns on the same rows.
- Calculate the mean, the largest and the smallest difference for each source, and count how many evenings each is out by three minutes or more.
- Chart the fortnight in Datawrapper as signed difference in minutes against date, with a line drawn at zero.
- Write one plain paragraph on why an error exists at all: the table is computed for a city centre or a broad zone, while you stand at your own longitude, your own altitude and behind your own wall, and a wall or a hill changes the moment the sun disappears from where you are standing.

WRITE THIS DOWN

Three columns of signed differences, the mean and range for each source, and the paragraph explaining where the difference comes from.

DONE WHEN

You can state the mean difference in minutes for your spot and say whether it holds steady across the fortnight or drifts.

Watch out. Dropping the signs and averaging the sizes. Three minutes early and three minutes late average to zero, not to three, and the direction is the whole finding.

Act 2 – fix it and measure steps 6 to 10, ending with a proven effect

6

Name the cost 50 MINUTES**Finish the costed problem statement and commit to publishing a corrected table for this one spot.**

- Write four lines: whose problem this is, the mean difference in minutes at this spot, the worst evening of the fortnight, and the minutes of mistiming per person per year at that mean.
- Count the people who use the same table at or near this spot - the household, the floor, the neighbours - and multiply to get the yearly total minutes across all of them.
- Write one line without hedging: this measures visibility from one spot, it is an observation and not a verdict, and questions of religious practice belong to a qualified scholar.
- Choose the fix and write it as one sentence: 'I will publish a corrected table for this spot and get at least five people to use it for fourteen days.'
- Show the page to an adult in the household and record their reaction in their own words.

WRITE THIS DOWN

The one-page costed problem statement, the count of people affected, the sentence about the scholar, and the fix as one testable sentence.

DONE WHEN

Somebody who was not there reads the page once and repeats both your minutes figure and the sentence about the scholar back correctly.

Watch out. Writing the page as a claim about what is correct to do. The page reports what was seen from one spot on fourteen evenings; that is the only claim it can carry.

7

Build the table 60 MINUTES**Turn the measured offset into a corrected thirty-day table with its evidence and its limits printed on it.**

- Read the computed times for the next thirty dates at your coordinates from Stellarium Web and put them in the sheet.
- Apply your measured mean offset in a formula cell, so the correction is visible arithmetic rather than a hand-typed number.
- Add a header block: the exact spot, the coordinates, the dates observed, the mean offset, the range and the number of usable evenings behind it.
- Add a footer block: the horizon this table assumes, the plain statement that it does not hold for anyone standing elsewhere, and the sentence that this is an observation and not a ruling.
- Give it to one person who was not involved, ask them what it means, and correct anything they misread.

WRITE THIS DOWN

The thirty-row corrected table, its header block, its footer block, and a note of what the first reader misunderstood.

DONE WHEN

The table fits on one page, states its offset and its evidence, and a stranger can say what it is for and what it is not for.

Watch out. Publishing a rounded offset with no range beside it. Print the mean and the spread together, so a reader knows how tightly to trust it.

8

Find five users 45 MINUTES**Put the corrected table in the hands of at least five people and agree how their use will be recorded.**

- Give or send the table to five people who stand at or near your spot, one at a time, explaining the one number and its limits in under a minute.
- Ask each of them directly whether they will use it for fourteen days, and write the answer down, including every refusal.
- Agree with each user how use gets recorded: a tick sheet on the wall, a daily message, or one question you ask at a fixed time.
- Write the user ledger: name, role, date given, agreed recording method, and their first reaction word for word.
- Record a thirty-second voice note stating what adoption you expect, dated before the fortnight starts.

WRITE THIS DOWN

The user ledger with five or more names, the recording method agreed with each, and the dated prediction.

DONE WHEN

Five people hold the table and each has told you on the record whether they intend to use it.

Watch out. Handing out ten copies and calling it ten users. A copy given is not a use; the count rises only when somebody records using it.

9

Measure the fortnight 20 MINUTES EACH EVENING FOR FOURTEEN EVENINGS, PLUS 45 MINUTES**Observe fourteen more evenings against the corrected table and count who actually used it.**

- Observe from the same chalk mark at the same eye height under the same safety rules, recording the observed minute exactly as before.
- Subtract the corrected table time from the observed time each evening to get the residual error in minutes.
- Collect every user's tick sheet or message thread on the agreed day and count days used, not days given.
- Ask every user the same two questions and write the answers word for word: did it change what you did, and will you keep using it.
- Write down every reason a user stopped: forgot, did not trust it, moved away, disagreed with the idea.

WRITE THIS DOWN

Fourteen residual differences, the adoption count in user-days, and every user's recorded answers including those who stopped.

DONE WHEN

You can state the residual error in minutes and the number of user-days, and both rest on records other people made.

Watch out. Counting a user who says they used it with nothing written down. Ask for the tick sheet or the thread; memory inflates adoption every time.

10

Share and reflect 60 MINUTES**Publish the finding, defend it to real people, and record what happens to the table now.**

- Record a defence video of no more than three minutes: the spot, the mean error, the sources, the corrected table, the residual, the adoption and the limits.
- Show the one-page explainer to three people who use the table and write down what each of them said.
- Send the fortnight chart to the expert you interviewed with one question: what would you have measured that I did not.
- Ask the users on camera whether the table stays on the wall and why, and let them answer without prompting.
- Complete the relations ledger with ten names, roles, dates and what each person replied.

WRITE THIS DOWN

The defence video, the one-page explainer, and the relations ledger holding ten logged relationships.

DONE WHEN

Ten relationships are logged with dates and replies, and the users have said on record whether they keep the table.

Watch out. Ending on how useful people said it was. The metric is minutes and user-days - report those first and opinions second.

Your nine deliverables in this project**1 - RESEARCH - WEEK 2****Question card**

One card naming the exact spot, its coordinates or paced description, the tables being tested, and the question: how many minutes out is this table for this doorstep, and why.

2 - OUTREACH - WEEK 3**Expert interview pack**

Five written questions for an astronomer, surveyor or almanac compiler, your fourteen-day difference chart attached, the date and channel of the request, and the reply recorded word for word.

3 - RESEARCH - WEEK 4**Evidence log**

Every observed time with its date and sky condition, every clock check with its offset in seconds, and every published time with the source and the location it was computed for.

4 - PROCESS - WEEK 5**Failure log**

The evenings lost to cloud, the night you arrived late, the watch that drifted, the user who stopped ticking the sheet, and what each of them did to the comparison, all dated.

5 - DESIGN - WEEK 5**The build**

The corrected one-page table itself, with its header of evidence and its footer of limits, together with the two charts of signed difference: the fortnight before and the fortnight after.

6 - DESIGN - WEEK 5**One-page explainer**

One page a neighbour reads in ninety seconds: the spot, the mean minutes, why a table computed for a zone misses a doorstep, the corrected table, and the line about the scholar.

7 - BRANDING - WEEK 5**Identity card**

A name and a one-line promise for the corrected table, so people can refer to it by name, plus the single sentence you want repeated at somebody else's table.

8 - OUTREACH - WEEK 6**Relations ledger**

Ten names with dates and replies: one astronomer or surveyor, three people who use the table, three peers who checked your arithmetic, and three people you sent the chart to who answered.

9 - DEFENCE - WEEK 6**Defence video**

Under three minutes on camera: the spot, the clock evidence, the mean error, the corrected table, the residual, the user-days, and the limits you accept without argument.

The four tiers, in this project

Starter

You observe from one marked spot on at least ten usable evenings, record each time to the minute against a checked clock, and put your questions to one stranger who works with time or sky.

Practitioner

You choose the observation spot and defend the choice, cite the source and the stated location of every published time you compare against, and make one chart a stranger reads correctly without your help.

Researcher

You write the protocol before the first evening, justify fourteen nights rather than three, and quantify in seconds the error added by your eye, your clock and your blocked horizon separately.

Contributor

You set your measured offset against a published ephemeris or an observatory figure, defend your method to an astronomer who disagrees, and publish every raw observation openly so others can recompute it.

The one expert you must talk to

Who. An observational astronomer, a physics or astronomy lecturer, a land surveyor who works in coordinates, or whoever computes the times a local calendar prints. A member of an amateur astronomy society who does timing work is just as good.

Where to find one. University physics and astronomy departments publish staff emails on their pages. Amateur astronomy societies run public observing nights and welcome questions. The meteorological department has a public enquiries line. A land surveyor at the municipal or revenue office works in coordinates every day and will explain longitude faster than anybody.

SEND EXACTLY THIS

Hello, my name is [name]. I have timed sunset from one fixed spot for fourteen evenings against a network-synchronised clock, and my observations sit several minutes off the printed table. Could you spare fifteen minutes on the phone this week to tell me where that difference comes from? I will send my five questions first.

Ask them

1. When a sunset time is published for a city, which point in that city is it computed for, and what horizon does the computation assume?
2. How many minutes can a wall, a ridge or a block of flats on the western skyline move the observed moment away from the computed one?
3. How far apart do two spots have to be, east to west, before their sunset times differ by a full minute at this latitude?
4. When you time an event by eye, what exactly do you take as the moment, and how closely do two observers usually agree?
5. If I published a corrected table for one spot, what would you insist appeared on the page before anybody used it?

You will be asked, without warning

1. Would those five people have changed their timing anyway without your table, and how do you know?
2. Your horizon is blocked by a wall. How much of your offset is longitude and altitude, how much is that wall, and how would you separate the two?
3. You lost evenings to cloud. Convince me the mean you published is stable, and tell me what a second fortnight would most likely have shown.
4. Somebody carries your table two streets away and uses it. What error have you handed them, and what did you print on the page to prevent it?

If you get stuck

- If nobody replies to your interview requests - then stop writing and go to a public observing night, a survey office counter or a physics department corridor, and ask one person two questions while they work.
- If your before and after look the same - then report that as the finding, check first whether the five users actually used the table on each of the fourteen evenings, and write what you find in the failure log.
- If you cannot see the horizon on most evenings - then choose a fixed edge you can always see, a roof line or a wall top, define and photograph that edge, and report every time against it instead.
- If you run out of time - then shorten the second fortnight to seven evenings rather than dropping the first, and print the shortened period on the chart itself.

Finished early?

Repeat the fortnight from a second spot two hundred metres away with a different skyline, and chart the two offsets on one axis.

The Thing That Keeps Breaking

Count what one latch, strap or bracket costs your household a year in rupees and lost hours.

THE QUESTION

Which small object in your house, shop or classroom fails most often, what does each failure cost in rupees and minutes, and does one reinforcement stop it failing?

Every factory, fleet, hospital and building runs on somebody counting how often a part fails and what each failure costs, and that counting has a name in industry: reliability and maintenance engineering. Manufacturers pay for failure data because a warranty claim, a stopped line or a callout costs many times what the part cost. The method here is the industry method at household scale: define one use, count the failures, find where the load concentrates, change one thing, and count again under identical conditions.

ACT 1 - FIND

You find the object that actually fails most - a gate latch, a bag strap, a shelf bracket, a tap washer, a door handle, a drawer runner, a broom head, a chair joint - and you build the case from evidence rather than memory: three people asked how often it fails, the physical repair scars photographed and counted, and the failure produced on purpose in a controlled test you can repeat. Then you cost it: what a repair costs, what a replacement costs, how many minutes each failure eats, and how often it happens, which together give rupees and hours per year.

A one-page costed problem statement carrying five lines: whose problem this is, failures per hundred uses in the controlled test, failures per fortnight in ordinary use, rupees per year and hours per year. Beside it sit a photograph of the failure point, an annotated drawing showing where the load concentrates, and the arithmetic behind every rupee figure with its source.

ACT 2 - FIX

You change one thing about the object using only what is already in the house or the shop - a second fixing, a packing plate under a bracket, a stop that limits travel, a doubled strap, a washer at the wear point - and you fit it. Then you run the identical hundred-use test and log the identical fortnight of ordinary use, with the same tester, the same load and the same definition of one use.

A four-bar chart on one axis: failures per hundred uses before and after, failures per fortnight before and after, plus the new rupees and hours per year, a named list of confounders, and a photograph of the fitted change taken from the same standing position as the before photograph.

YOU MEASURE

failures of one object per hundred identical uses, and failures per fortnight in ordinary use

BEFORE

Two counts taken before anything is changed: failures in a controlled test of one hundred identical uses, tallied by hand and filmed, with the load and the definition of one use written down first; and failures logged on a tally card in ordinary use across fourteen days, each with the date, the user, the minutes lost and the rupees spent.

AFTER

The identical hundred-use test on the changed object, run by the same person in the same place with the same load and the same speed, plus fourteen more days of ordinary-use logging on a fresh tally card in the same place, using the same definition of a failure.

Safety and ethics - not optional

- Nothing electrical and nothing gas. A plug top, a switch plate or an extension lead is examined only with it unplugged from the wall and the cover left screwed shut; nothing is opened, stripped, rewired or plugged in to test, and nothing attached to a gas pipe, cylinder, regulator or burner is part of this project.
- Feet on the floor. No ladders, no stools, no climbing, no roof and no work above your own standing reach; if the object sits out of reach, an adult brings it down or you choose a different object.
- Test loads fall onto empty floor and nothing else. Load with weight you can hold in one hand - filled bottles, a bag of rice, a bucket half full - hung or placed so that if it drops it lands on bare floor, never over a foot, a hand, a lap, a pet or a phone; stand to one side, and for anything under tension, spring, elastic or wire, wear eye protection or keep your face turned away.
- Out of scope: anything structural or anything holding a person off the ground - a stair tread, a balcony rail, a ladder rung, a swing, a bed frame, a roof or wall fixing. A loose chair joint may be measured and reinforced only with the chair empty on the floor and loaded by hand with weight; no person is ever the test load. No power tools unless an adult is holding the work, and no cutting, drilling or heating on your own.

WHAT YOU USE - HIGH-TECH ROUTE

The camera app already on the phone - dated close-ups of the failure point, photographs of every past repair scar, and the before-and-after pair shot from the same standing position

Google Sheets - the candidate table, the hundred-use tally, the fourteen-day failure log, the rupees-and-hours cost model in visible formula cells, and the four-bar before-and-after chart

Excalidraw (excalidraw.com), free and browser-based, no account needed - the annotated load-path drawing showing where the force enters the object and where it concentrates

Tinkercad (tinkercad.com), free account - the redesign or reinforcement drawn to the dimensions you measured, so a tradesman can see what you mean

Google Docs - the evidence log, the expert interview pack and the one-page explainer

Google Drive - dated folders holding the test videos, the scale or tally photographs and the two matched photographs

Everything runs on a phone and a browser: the camera records the failure point and the before-and-after, a free spreadsheet holds the tally and the cost model in visible formulas, and a free drawing tool carries the load path and the redesign.

Act 1 - find the problem steps 1 to 5, ending with a costed problem statement

1

Find the thing 45 MINUTES

Walk your house, shop or classroom and list every object that has failed more than once, then choose one.

- Walk one lap of each room with the sheet open and write down every object that has been repaired, tied, taped, glued, wired or propped.
- Ask three people who use these things daily how often each one fails, and record their answers as times per month, never as the word 'often'.
- Photograph each candidate where it sits, close enough to show the joint or the point that gives.
- Score each candidate in three columns: times per month, minutes lost per failure, and whether it can be tested without touching anything electrical, gas, structural or above your reach.
- Choose the highest-scoring object that passes the safety column, and write one sentence saying why you chose it over the runner-up.

WRITE THIS DOWN

The candidate table with three people's frequency answers, the safety column, the chosen object and the written reason.

DONE WHEN

One object is named, photographed and defended in writing against at least four rejected candidates.

Watch out. Choosing the object that annoys you most rather than the one that fails most. Let the table decide; if the annoying one wins on numbers, keep it, but it has to win.

2

Read the scars 40 MINUTES**Collect physical evidence that this object has failed before, instead of trusting anybody's memory.**

- Photograph every repair on it: old glue, a second screw hole, wire, tape, a replaced part, a bent bracket, a worn groove.
- Count the separate repair marks and write the count down, because each mark is a past failure somebody already paid for.
- Ask the three users when each repair happened and write the nearest month against each mark.
- Ask whoever fixed it last what they used and what it cost, and check whether the receipt or the leftover material still exists.
- Measure the object with a tape and record the dimensions that matter: thickness at the failure point, length of the arm, diameter of the fixing.

WRITE THIS DOWN

A dated repair history with one line per mark, the measured dimensions in millimetres, and the photographs filed in a dated Drive folder.

DONE WHEN

Your count of past failures comes from marks you photographed and people you asked, not from one person's recollection.

Watch out. Accepting 'it breaks all the time' as data. Convert every statement into a count and a month, and write down who said it.

3

Count it failing 60 MINUTES, THEN A TALLY KEPT FOR FOURTEEN DAYS**Produce the failure on purpose in a controlled test, and start a fourteen-day log of failures in ordinary use.**

- Define one use in writing - one full open and close, one lift with the bag loaded to its usual weight, one turn of the handle - and do not change the definition afterwards.
- Run one hundred of those identical uses at a steady, ordinary speed with the same load each time, marking a tally every time it slips, jams, loosens, tears or comes apart.
- Load only with weight you can hold in one hand, placed so it can only fall onto bare floor, with feet and hands clear and your face turned away from anything under tension.
- Film thirty seconds of the test and one close-up of the exact point that gives, so a stranger can see the failure rather than take your word.
- Tape a tally card beside the object and begin a fourteen-day count of failures in ordinary use, one line per failure with date, time and who was using it.

WRITE THIS DOWN

The written definition of one use, the failures-per-hundred-uses figure, the load used, the tally card, and the video file names in the evidence log.

DONE WHEN

A failures-per-hundred-uses number exists, the fourteen-day log has begun, and a stranger could repeat your test from your written definition alone.

Watch out. Cycling it faster and harder than real use to force a failure. A test that does not look like ordinary use tells you nothing about ordinary use, so match the speed and the load and write both down.

4

Cost one failure 50 MINUTES**Work out what a single failure costs and turn it into rupees and hours per year.**

- Price the repair from a receipt or a shop visit: the material, the part, and what a tradesman charges to come, each with the shop or the name beside it.
- Price a full replacement of the object at two shops and record both prices with the shop names.
- Time the last failure end to end with the people involved: minutes to notice, to find tools, to fix, to walk to the shop, and the minutes the thing was unusable.
- Multiply cost per failure by the failure rate the three users gave you, and again by the rate your own tally implies, so two independent estimates sit side by side.
- Put the arithmetic in visible formula cells: failures per year times rupees per failure, and failures per year times minutes per failure divided by sixty.

WRITE THIS DOWN

Rupees per failure, minutes per failure, failures per year from two sources, and rupees and hours per year with every formula visible.

DONE WHEN

Two independent rupees-per-year figures exist and you can say which is the more conservative and why.

Watch out. Counting only the part you bought. The trip to the shop, the waiting and the thing being unusable are usually larger than the part, so count the minutes.

5

Find the weak point 50 MINUTES**Work out where the load concentrates and why the same point gives every time.**

- Photograph the failure point close up, then draw the object in Excalidraw and trace the path the force takes, from where the hand or the weight pushes to where the object is held.
- Mark three places on the drawing: the narrowest section, the sharpest corner, and the single fixing carrying most of the load, because failures start at those three.
- State plainly whether the material gave or the joint gave, since a fixing working loose is a different problem from a bar bending.
- Check whether the same point failed at every repair mark from step two, and write yes or no with the evidence.
- Put the one question you cannot answer yourself to the tradesman you interview, and write their answer down word for word.

WRITE THIS DOWN

The annotated load-path drawing, one paragraph naming the weak point in plain language, and the expert's answer as spoken.

DONE WHEN

You can point at one place on the object and explain, in a sentence a stranger follows, why the load ends up there.

Watch out. Blaming the material because that is easier to say. Most household failures are a fixing loosening, a sharp corner concentrating load, or a part hammering against a stop, so look at the joint before the metal.

6**Name the cost** 50 MINUTES**Finish the costed problem statement on one page and choose the single change you will make.**

- Write five lines: whose problem this is, failures per hundred uses, failures per fortnight, rupees per year, hours per year.
- Build one Google Sheets bar chart of rupees per year for your object beside the two runners-up from step one, titled with the finding rather than with the word 'chart'.
- List three possible fixes using only what is already in the house or the shop: a second fixing, a packing plate, a stop that limits travel, a doubled strap, a washer at the wear point.
- Choose one and write the sentence: 'I will change X to Y and expect failures per hundred uses to fall from A to B and failures per fortnight from C to D.'
- Show the page to whoever owns the object, get their agreement to the change, and record it as a dated note before you touch anything.

WRITE THIS DOWN

The one-page costed problem statement, the three candidate fixes with the failure each would prevent, and the chosen fix as one testable sentence.

DONE WHEN

Somebody who was not there reads the page once and repeats your rupees-per-year figure back correctly.

Watch out. Choosing a fix that needs something bought. Nothing bought is the rule, so cost the shop fix honestly on paper and reinforce with what is already there, or you will have nothing to measure.

7**Draw and fit it** 60 MINUTES**Draw the change to real dimensions, fit it, and write the protocol that keeps the after-test identical to the before-test.**

- Draw the reinforcement in Tinkercad using the dimensions measured in step two, showing the new fixing or plate in position on the object.
- Write what stays fixed: same definition of one use, same load, same tester, same place, same speed, same hundred-count, same definition of a failure.
- Fit the change with what is already in the house; if a hand tool is needed, an adult holds the work, and nothing is cut, drilled or heated by you alone.
- Photograph the object before fitting and after fitting from the same standing position with the same item in frame for scale.
- Record a thirty-second voice note stating your prediction and file it with today's date, before any after-data exists.

WRITE THIS DOWN

The dimensioned drawing, the fixed protocol as a numbered list, the two matched photographs and the timestamped prediction.

DONE WHEN

The change is fitted, the protocol is written down, and the prediction is on file before the first after-test is run.

Watch out. Improving three things at once because you already have the tools out. One change only, or you can never say which one worked.

8

Test it again 60 MINUTES**Run the identical hundred-use test on the changed object and count failures exactly as before.**

- Use the same load, the same speed, the same tester and the same definition of one use, checked line by line against the protocol before starting.
- Tally every failure of the same kind, and record separately anything new that started going wrong because of the change.
- Film thirty seconds of the changed object under test, framed the same way as the first video.
- Inspect the change afterwards and photograph it: has it loosened, bent, worn, or shifted position.
- Write down what went wrong on the day: a distracted count, a load that slipped, a helper who joined in halfway.

WRITE THIS DOWN

Failures per hundred uses after the change, the inspection photographs, and a dated failure-log entry naming everything that deviated.

DONE WHEN

The after-test has the same load, speed and use-definition as the before-test, and the failure log holds at least one honest entry.

Watch out. Testing gently because you want the fix to work. Count out loud, film the run, and let somebody else watch the last twenty uses.

9

Fourteen days again 45 MINUTES ACROSS TWO WEEKS**Log failures in ordinary use for fourteen more days and compare like with like.**

- Tape a fresh tally card in the same place and log every failure with date, time, user and minutes lost, exactly as in the baseline fortnight.
- Check the object once a week for the change working loose, photograph it, and write down what you find.
- Chart four bars on one axis in Google Sheets: failures per hundred uses before and after, failures per fortnight before and after.
- List every confounder you can name: colder or wetter weather, a lighter user, the object being used less because everybody knows it is being watched, a second repair somebody made without telling you.
- Recalculate rupees and hours per year with the same cost model, and state whether the fix saved more than the time it took to make.

WRITE THIS DOWN

The four-bar chart, the new rupees and hours per year, the confounder list, and the weekly inspection notes.

DONE WHEN

You can state the before figures, the after figures, and at least two reasons the difference might not be your doing.

Watch out. Reporting the hundred-use test and quietly dropping the fortnight log because it disagreed. Report both, and where they disagree, say so, because that disagreement is itself the finding.

10

Share and reflect 60 MINUTES**Publish the finding, defend it to real people, and record whether the change stays on the object.**

- Record a defence video of no more than three minutes: the object, the failure point, the two before-counts, the change, the two after-counts and the limits.
- Show the one-page explainer to three people who use the object and write down what each of them said.
- Send the chart and the drawing to the tradesman you interviewed with one question: what would you have reinforced that I did not.
- Ask the owner of the object on camera whether the change stays and why, and let them answer without prompting.
- Complete the relations ledger with ten names, roles, dates and what each person replied.

WRITE THIS DOWN

The defence video, the one-page explainer, and the relations ledger holding ten logged relationships.

DONE WHEN

Ten relationships are logged with dates and replies, and the owner has said on record whether the reinforcement stays.

Watch out. Calling it a success because the object feels sturdier. The metric is failures counted, rupees and hours, so report those first and opinions second.

Your nine deliverables in this project

1 - RESEARCH - WEEK 2

Question card

One card naming the object, where it sits, who uses it, and the question: how often does this fail, what does each failure cost in rupees and minutes, and will one reinforcement stop it.

3 - RESEARCH - WEEK 4

Evidence log

Every tally sheet with its date and counter, the dimensions in millimetres, a photograph of each repair scar, every price with the shop it came from, and the timed minutes lost per failure.

5 - DESIGN - WEEK 5

The build

The fitted reinforcement itself with its dimensioned drawing, plus the test rig used for the hundred uses, and the four-bar chart of failures before and after on one axis.

7 - BRANDING - WEEK 5

Identity card

A name and a one-line promise for the reinforcement, so the household can ask for it by name, plus the single sentence you want repeated when somebody else's latch gives way.

9 - DEFENCE - WEEK 6

Defence video

Under three minutes on camera: the object, the failure point close up, the definition of one use, both before-counts, the change fitted, both after-counts, and the limits you accept without argument.

2 - OUTREACH - WEEK 3

Expert interview pack

Five written questions for a carpenter, welder, mechanic, tailor or maintenance technician, your load-path drawing and failure count attached, the date and channel of the request, and the reply recorded word for word.

4 - PROCESS - WEEK 5

Failure log

The counts you lost track of, the load that slipped, the fortnight interrupted by a holiday, the reinforcement that worked loose in week one, and what each of them did to the comparison, all dated.

6 - DESIGN - WEEK 5

One-page explainer

One page a neighbour reads in ninety seconds: the object, the failures per hundred uses, the rupees and hours per year, the one change, the after-counts, and what this test cannot tell anybody.

8 - OUTREACH - WEEK 6

Relations ledger

Ten names with dates and replies: one tradesman who repairs these, three people who use the object daily, three peers who checked your tally, and three people you sent the chart to who answered.

The four tiers, in this project

Starter

You choose one object, ask three users how often it fails, count the repair scars, run one hundred identical uses counting failures, and question one tradesman who repairs these for a living.

Researcher

You write the test protocol before the first count, justify one hundred uses and fourteen days rather than fewer, and quantify the error your tally, your load and your single tester introduce.

Practitioner

You define one use yourself and defend that definition, cite every price to the shop it came from, and produce one before-and-after chart a stranger reads correctly without you explaining the axes.

Contributor

You set your failure rate against a published component or maintenance standard, defend your method to a maintenance engineer who disagrees, and publish your tally sheets, dimensions and drawings openly so others can repeat it.

The one expert you must talk to

Who. A carpenter, welder, motorcycle mechanic, tailor, plumber or building maintenance technician - somebody paid to repair this class of object, who therefore knows which part goes first and how soon it comes back.

Where to find one. The furniture workshop, welding shop, tailor or hardware market nearest you, visited at a quiet hour rather than a busy one. A school, hospital, hotel or factory maintenance technician is reached through the office by asking for whoever fixes the doors. A motorcycle mechanic on the main road repairs the same failure forty times a week and will talk while working.

SEND EXACTLY THIS

Hello, my name is [name]. A [object] in our house has failed four times this year and I have counted what each failure costs us in rupees and minutes. You repair these for a living, so you know why they go. Could you give me fifteen minutes at a quiet hour for five questions? I will bring the broken part.

Ask them

1. Of the ones people bring you, which part fails first, and what is it about that part that makes it first?
2. When you repair this, do you put it back exactly as it was, or do you change something, and what do you change?
3. How long does your repair last compared with the original, and how do you know that?
4. What would you have to see to say a thing is genuinely worn out rather than badly fitted?
5. If somebody wanted this to stop failing and could spend nothing at all, what would you tell them to do?

You will be asked, without warning

1. Would the failures have dropped anyway without your change, and how do you know?
2. Your hundred-use test and your fortnight log point in different directions. Which do you believe, and what would settle it?
3. You counted for fourteen days before and fourteen days after. Convince me those two fortnights were comparable, and name what was not.
4. If your reinforcement works loose in three months, what was this project worth, in rupees and in hours?

If you get stuck

- If nobody will talk to you - then go to the hardware market or the furniture workshop at the quiet hour, buy nothing, and ask one repairer two questions while they work.
- If your before and after look the same - then check first whether the change is still fitted and still tight, count how many times the object was actually used in each fortnight, and report the null result with both use-counts beside it.
- If you cannot produce the failure in a controlled test - then drop the hundred-use test, say so plainly, extend the ordinary-use log to a fixed longer period before and after, and make that log your only metric.
- If you run out of time - then shorten both logging periods to the same seven days rather than dropping the baseline, and write the shortened period on the chart itself.

Finished early?

Fit the same reinforcement to an identical object in a second household and run the identical hundred-use test on both.

The Four-Hundred-Rupee Leak

Read your own meter for a week and find the one appliance quietly taking hundreds of rupees a month.

THE QUESTION

Which single appliance or habit in your home costs the most rupees per month, measured from your own meter rather than guessed?

A household that cannot say where its units go cannot argue with its bill, and neither can a school, a hospital or a factory. Energy auditing is a trade built on exactly this method - baseline, isolate, convert to money, change one thing, measure again - and it is paid for because the savings pay for it. Grid operators, solar installers and building managers all hire people who can defend a before-and-after number in front of somebody who does not want to believe it.

ACT 1 - FIND

You read your own meter at the same two times every day for a week to build a baseline, then isolate one appliance by running it alone for a measured period and reading the meter before and after. You convert units to rupees using the tariff printed on your household's own bill, and you log load-shedding, generator and UPS hours every single day.

A one-page costed problem statement carrying five lines: whose bill, units per month for the one appliance, rupees per month at your household's own rate, rupees per year, and that appliance's share of the whole house. Behind every line sits a dated meter photograph or a circled line on the bill.

ACT 2 - FIX

You change exactly one thing that costs nothing - a setting, a timing, a habit, a door seal, or a bulb already in the house - and keep reading the meter at the same two times for three weeks. The isolation test is repeated under the new condition, and load-shedding hours are logged for both periods so the comparison survives them.

A chart of the baseline week against weeks one, two and three in units and in rupees, plus the mean after-figure, the next printed bill set beside your own arithmetic, a named confounder list, and the bill-payer's recorded answer on whether the change stays.

YOU MEASURE

rupees per month for one appliance or one habit

BEFORE

Units per hour taken from a timed isolation run against the meter, multiplied by hours actually tallied per week, multiplied by the rupee-per-unit rate calculated from your household's own bill. Load-shedding, generator, solar and UPS hours are recorded for the same week.

AFTER

The same isolation test and the same twice-daily meter readings repeated for three weeks after the change, compared with the baseline week and with the next printed bill, with load-shedding hours stated for both periods.

Safety and ethics - not optional

- Never open, unscrew or remove the cover of anything: an appliance, a socket, a switch plate, a distribution board, a fuse box or the meter itself. If a test needs a cover to come off, the test is out of scope - choose a different appliance.
- Never touch wiring, terminals, exposed metal or the face of the meter. Every reading is taken by looking only, from normal standing distance, with dry hands and dry feet, and never in the rain or with wet floors underfoot.
- Switch appliances on and off only at the plug or the wall switch the household already uses every day, and only with the person who runs the household agreeing beforehand. Never at the main board. Never climb or stand on anything to reach a meter mounted high - ask somebody else in the household to stand beside you and read it out instead.
- Record load-shedding, generator, solar and UPS hours every day of both periods. Power that did not come through the meter breaks the comparison, and a before-and-after made without that note is worth nothing.

WHAT YOU USE - HIGH-TECH ROUTE

Google Sheets - the meter log, the block subtractions, units-per-hour and rupee arithmetic in visible formula cells

Your distribution company's online bill page - bill.pitc.com.pk for LESCO, IESCO, MEPCO, GEPCO and the other PITC-hosted companies, or ke.com.pk for K-Electric - twelve months of billed units

The NEPRA tariff schedule at nepra.org.pk - the notified slab rates, fixed charges and taxes sitting behind your bill

Datawrapper, free plan - the day-block and night-block chart and the four-week before-and-after chart

Google Drive - dated folders holding every meter photograph as timestamped evidence

Google Docs - the evidence log, the one-page explainer and the interview pack

The meter stays untouched and the browser does the rest: a free spreadsheet holds the readings, the distribution company's own bill portal and the published tariff schedule supply the rupee rate, and a free chart tool turns three weeks into one picture.

Act 1 – find the problem steps 1 to 5, ending with a costed problem statement

1 Find the meter 40 MINUTES

Locate your meter, work out what its display means, and take the first dated reading without touching anything.

- Stand in front of the meter in daylight and photograph the whole face, then the number panel close up, keeping both hands at your sides.
- Write down the meter number printed on the front and check it matches the meter number printed on your bill.
- Identify which figure is the units total in kWh; on a digital meter press nothing and wait for the display to cycle to that screen by itself.
- Note whether the final digit is a decimal, and whether the meter shows separate peak and off-peak totals.
- Open a Google Sheets file named 'Meter log' with columns: date, time, reading, load-shedding hours since last reading, generator or UPS used, notes.

WRITE THIS DOWN

The meter number, the meter type, what each figure on the display means, and the first reading with the date and the time to the minute.

DONE WHEN

A photograph of the display exists, the first reading is in the sheet, and the meter number matches the number on the bill.

Watch out. Pressing buttons on a digital meter to reach the screen you want. Press nothing and wait for the cycle. If units never appear, photograph every screen and ask the expert which one it is.

2 Seven days of readings 10 MINUTES TWICE A DAY FOR SEVEN DAYS

Build the baseline by reading the meter at the same two clock times every day for a week.

- Choose two fixed times, for example 07:00 and 22:00, and set two daily alarms for them.
- At each alarm photograph the display and type the reading into the sheet within one minute, with the actual time to the minute.
- Record load-shedding start and end times every day, and any hours the house ran on a generator, a UPS or solar.
- Subtract in formula cells to get units used in the day block and units used in the night block.
- Add one word for the day's weather and a note on whether the house was fuller or emptier than usual.

WRITE THIS DOWN

Fourteen readings, seven day-block totals, seven night-block totals, and a load-shedding line for every day including the zeros.

DONE WHEN

Seven complete days with no missing reading, and every day carries a load-shedding note even when it is zero.

Watch out. Reading at 'about ten'. A reading an hour late wrecks the block comparison - write the real clock time and let the formula work from it.

3

Read the bill properly 45 MINUTES**Turn your household's own bill into a rupee-per-unit rate you can defend.**

- Photograph this month's bill and last month's, then open your distribution company's online bill page and pull twelve months of billed units.
- Circle on the photograph: units billed, the slab breakdown, fixed charges, every tax line, and the total payable.
- Calculate two rates - total payable divided by units billed, and the marginal slab rate your next unit falls into, taken from the NEPRA tariff schedule.
- Enter both rates in the sheet and write one sentence naming which rate you will use for the appliance costing and why.

WRITE THIS DOWN

Twelve months of billed units, both rupee-per-unit rates, and the stated reason for the rate you chose.

DONE WHEN

You can say what one extra unit costs your household tonight and point to the line on the bill or the tariff schedule that proves it.

Watch out. Using the headline slab rate and ignoring taxes and fixed charges. Show both rates: the marginal rate is what a saved unit is worth, the average rate is what the bill feels like.

4

Isolate one appliance 60 MINUTES**Measure what one appliance draws by running it alone against the meter.**

- Agree one appliance with the household: an air conditioner, a fridge, a water pump, a geyser, an iron, a heater, or the lights on one floor.
- Copy the wattage and voltage printed on the appliance's own label, without moving it, opening it or removing any cover.
- Agree a quiet window, then switch off every other load at the wall switches the household already uses, leaving only the one appliance running.
- Read and photograph the meter, start the stopwatch, run the appliance for a measured thirty to sixty minutes, then read and photograph the meter again.
- Divide units used by hours run to get units per hour, then repeat the whole test on a second day to see whether the figure holds.

WRITE THIS DOWN

Start reading, end reading, minutes run, units per hour, the label wattage, and the gap between the two test days.

DONE WHEN

Two independent isolation tests give units per hour within a tenth of each other, or you have written down exactly why they do not.

Watch out. Forgetting the fridge, the router and the standby lights. Anything left on lands inside your appliance's figure - list what could not be switched off and subtract its measured share.

5

Count the hours 40 MINUTES ACROSS THE SAME WEEK**Log how many hours the appliance actually runs and turn that into rupees per month.**

- Keep a tally sheet beside the appliance and mark every start and stop time for seven days.
- For a fridge or a pump that cycles on its own, sit with it for a full hour and time how many minutes in that hour it actually runs, twice at different times of day.
- Multiply units per hour by hours per week, then by 4.33 weeks, then by the rupee rate you chose.
- Set that figure against the whole-house units from step two and state what percentage of the house this one appliance is.

WRITE THIS DOWN

Hours per week, units per month, rupees per month for this one appliance, and its share of the whole house.

DONE WHEN

The appliance figure exists in rupees per month and it is smaller than the whole-house bill.

Watch out. An appliance that appears to cost more than the entire bill. That means the isolation test or the hours are wrong - redo the test before writing another line.

6 Name the leak 50 MINUTES

Finish the costed problem statement on one page and choose the single change you will make.

- Write five lines: whose problem this is, units per month, rupees per month, rupees per year at today's tariff, and share of the whole house.
- Chart the seven day-blocks against the seven night-blocks in Datawrapper, titled with the finding rather than with the word 'chart'.
- List three candidate changes that cost nothing: a thermostat or fan setting, a timing shift, a door seal pressed back, a bulb already owned, or one habit.
- Choose one and write: 'I will change X for three weeks and expect this appliance to fall from A units per week to B.'
- Show the page to whoever pays the bill and record their agreement, dated, before anything changes.

WRITE THIS DOWN

The one-page costed problem statement, the three candidate changes, and the chosen change as one testable sentence.

DONE WHEN

Somebody who was not there reads the page once and repeats your rupee figure back correctly.

Watch out. Choosing a change that needs something bought. Use what is already in the house, or the result measures money spent rather than a habit changed.

7 Set the after rules 40 MINUTES

Write the protocol that makes the after-measurement comparable with the before.

- Write what stays fixed: the same two clock times, the same meter, the same rupee rate, the same appliance, the same tally method.
- Write what is allowed to move: only the one thing you named in step six.
- Prepare twenty-one blank dated rows in the sheet before any data exists.
- Write the confounders you already expect: weather, guests, load-shedding hours, a different person using the appliance.
- Record a dated prediction of the after figure, in units and in rupees, before anything is changed.

WRITE THIS DOWN

The numbered protocol, the twenty-one blank dated rows, the confounder list, and the timestamped prediction.

DONE WHEN

The sheet sits ready and empty for three weeks and the prediction exists with a date that precedes the data.

Watch out. Changing two things at once because both looked easy. Two changes give one number you cannot attribute to either - change one and keep the second for the stretch.

8

Measure week one 10 MINUTES TWICE A DAY FOR SEVEN DAYS**Run the change for seven days and read the meter exactly as you read it before.**

- Take both daily readings at the same two clock times and photograph each display.
- Keep the appliance tally sheet running exactly as it ran in Act 1.
- Repeat the isolation test once under the new setting and record units per hour again.
- Log load-shedding and generator hours daily, and mark the week as disturbed if those hours moved sharply against the baseline week.
- Write down every slip: a missed reading, a night the change was forgotten, a guest who reversed it.

WRITE THIS DOWN

Seven days of readings, one repeated isolation test, the hours tally, and a dated failure entry.

DONE WHEN

Week one is complete with no empty cells and the failure log holds at least one honest entry.

Watch out. Being unusually careful with electricity all week because you are watching yourself. Name that effect in the log - it is the reason you measure for three weeks and not one.

9

Weeks two and three 60 MINUTES PLUS THE DAILY READINGS**Repeat two more weeks, then check your finding against the next printed bill.**

- Take the same two readings daily for a further fourteen days without altering anything else.
- Calculate mean units per week across the three after-weeks and set it against the baseline week.
- When the next bill arrives, compare its billed units with your own meter arithmetic and explain any gap in writing.
- Chart baseline against weeks one, two and three on one axis, in units and again in rupees.
- Write the confounder paragraph: temperature, load-shedding hours, people in the house, and anything else that moved.

WRITE THIS DOWN

The four-week chart, the mean after-figure, the bill comparison with its explanation, and the confounder paragraph.

DONE WHEN

You can state the before figure, the after figure, and at least two reasons the difference might not be your doing.

Watch out. Blaming the bill when it disagrees with your meter. Check the billing dates first - a bill rarely covers the same days you measured.

10

Share and reflect 60 MINUTES**Publish the finding, defend it to real people, and record what the household will keep.**

- Record a defence video of no more than three minutes: the meter, the number, the method, the change, the result and the limits.
- Show the one-page explainer to three neighbouring households on the same tariff and write down what each of them said.
- Send the chart to the expert you interviewed with one question: what would you have measured that I did not.
- Ask whoever pays the bill, on camera, whether the change stays and why, and let them answer without prompting.
- Complete the relations ledger with ten names, roles, dates and replies.

WRITE THIS DOWN

The defence video, the one-page explainer, and the relations ledger holding ten logged relationships.

DONE WHEN

Ten relationships are logged with dates and replies, and the bill-payer has said on record whether the change stays.

Watch out. Presenting the rupee saving without the load-shedding note. Everyone on your street will ask about it - answer it before they do.

Your nine deliverables in this project

1 - RESEARCH - WEEK 2

Question card

One card naming the household, the meter number and the appliance under test, and the question: what does this one appliance cost per month, measured from the meter rather than guessed.

3 - RESEARCH - WEEK 4

Evidence log

Every meter reading with its clock time and photograph or ink entry, both isolation tests with start and end readings, the circled tariff lines, and a load-shedding note for every single day.

5 - DESIGN - WEEK 5

The build

The measurement rig itself - the log, the tally card, the two fixed alarm times, the isolation procedure written as steps - plus the four-week before-and-after chart on one axis.

7 - BRANDING - WEEK 5

Identity card

A name and a one-line promise for the measurement, so the household refers to it by name, plus the single sentence you want repeated to the neighbour who asks about their own bill.

9 - DEFENCE - WEEK 6

Defence video

Under three minutes on camera: the meter, the isolation method, the rupee figure, the one change, the three-week result, the bill comparison, and the limits you accept without argument.

2 - OUTREACH - WEEK 3

Expert interview pack

Five written questions for an energy auditor or maintenance engineer, your isolation figures attached as one page, the date and channel of the request, and the reply recorded word for word.

4 - PROCESS - WEEK 5

Failure log

The readings missed, the night the change was forgotten, the isolation test spoiled by a load you could not switch off, and what each of them did to the comparison, all dated.

6 - DESIGN - WEEK 5

One-page explainer

One page a neighbour reads in ninety seconds: the appliance, the rupees per month, the change made, the three-week result, the load-shedding caveat, and what the figure cannot prove.

8 - OUTREACH - WEEK 6

Relations ledger

Ten names with dates and replies: one energy auditor or engineer, three people who pay or share this bill, three peers who checked your arithmetic, three people you sent the chart to who answered.

The four tiers, in this project

Starter

You take fourteen meter readings at two fixed times, isolate one appliance with a timed run, convert units to rupees from your own bill, and put your questions to one stranger.

Researcher

You state the protocol before measuring, justify three after-weeks rather than one, and quantify how load-shedding hours, weather and the loads you could not switch off limit your figure.

Practitioner

You choose the appliance and defend the choice, cite the exact tariff line you used, and make one chart a stranger reads correctly without you standing there explaining the axes.

Contributor

You set your measured figure against the appliance's rated wattage and the published tariff schedule, defend the isolation method to an energy auditor, and publish every reading openly for recomputation.

The one expert you must talk to

Who. An energy auditor, or the maintenance engineer or technician who manages the electricity bill for a school, hospital, hotel, mill or small factory. A solar installer who sizes loads for a living works just as well.

Where to find one. Ring the office of a nearby school, hospital, hotel or small factory and ask for whoever signs off the electricity bill. Search LinkedIn for 'energy auditor' plus your city. Your distribution company's customer services office keeps an energy-conservation desk. Any solar installation company employs somebody who sizes household loads all day.

SEND EXACTLY THIS

Hello, my name is [name]. I read my house meter twice a day for a week, then ran one appliance alone to cost it. My figure is [amount] rupees a month and I think my method has a hole in it. Could you spare fifteen minutes on the phone this week to tell me where?

Ask them

1. When you audit a building, what do you measure first, and why that before anything else?
2. My isolation test ran for forty minutes with everything else switched off. What is still drawing current in a house at that moment?
3. Would you cost a saved unit at the marginal slab rate or at the average rate, and why?
4. How do you separate a real saving from a change in the weather or in load-shedding hours?
5. What is the commonest appliance you find people are wrong about, and how wrong are they?

You will be asked, without warning

1. Would the bill have fallen anyway without your change, and how do you know?
2. Your isolation test ran for forty minutes on one day. What else was drawing current at that moment, and how many units did it add?
3. The tariff has slabs. If your household crossed a slab boundary during the three weeks, what happens to your rupees-per-month figure?
4. Somebody says your saving is just cooler weather and lighter load-shedding. Answer them using only your own data.

If you get stuck

- If nobody replies to your messages - then walk into a nearby school or small factory office and ask for the person who checks the electricity bill; ask two questions standing up.
- If your before and after look the same - then compare load-shedding hours across both periods first, then report the null result with the numbers, because an honest zero is a finding.
- If you cannot isolate the appliance because nothing else can be switched off - then agree a one-hour window with the household when only that appliance runs, measure the whole house, and write down the residual load you could not remove.
- If you run out of time - then shorten the after-period to two weeks, keep the twice-daily readings intact, and state the shortened period on the chart rather than filling the gaps in.

Finished early?

Isolate a second appliance and rank every measured load in the house by rupees per month, so the household can see which one to attack next.

The Ten Minutes That Teach

Teach five people the same ten minutes, test them twice, and count what seventy-two hours quietly deletes.

THE QUESTION

How much of one ten-minute lesson is still there in the people you taught three days later, and does changing one thing about how it is revised keep more of it?

Organisations spend enormous sums on training that nobody checks three days afterwards, and the field that does check - instructional design and learning measurement - is paid precisely because forgetting is expensive and invisible. A trainer who can show a retention curve instead of a satisfaction form is worth more than one who cannot, in schools, in hospitals, in factories and in software companies. The method here is the standard method: identical content, identical questions, identical gap, one variable changed, and the limits reported rather than buried.

ACT 1 - FIND

You take one small, self-contained thing you can teach fully in ten minutes, teach it identically to at least five people, and test them immediately with five written questions marked against a key you wrote first. Seventy-two hours later, with no warning, no reminder and nothing to revise, you give the identical five questions again, and the distance between the two scores is your finding.

A one-page costed problem statement carrying five lines: who was taught, the mean immediate score, the mean score at seventy-two hours, the percentage lost, and what that loss is worth in minutes of teaching per week and hours or rupees per year at the rate teaching is actually paid for here. Beside it sits a two-point line for the group, marked with the number of people and the exact gap in hours.

ACT 2 - FIX

You change exactly one thing about how the lesson is revised - a two-minute recap at day one, one practice question at day one, the learner explaining it back at the end, or a written summary in their own words - and you teach a second, comparable group the identical ten minutes from the same script. The same five questions are asked at the same two moments and marked to the same key by the same person.

Two lines on one chart, one per group, each running from the immediate score to the seventy-two-hour score, with the number of people on each, the retained percentage for each, the difference between them, and a written list of every way the two groups were not alike.

YOU MEASURE

the share of an immediate test score still present after seventy-two hours

BEFORE

Five or more people taught the same ten minutes from a written script, tested at once on five written questions marked one mark each against a key written before anybody answered, then given the identical five questions in the identical order seventy-two hours later, unannounced, with no revision in between. The baseline is the group mean second score expressed as a percentage of the group mean first score.

AFTER

A second group of at least five, taught the same ten minutes from the same script by the same teacher, with one named change to how the material is revised, tested at the identical two moments with the identical five questions, marked to the same key by the same person, and expressed as the same percentage.

Safety and ethics - not optional

- Consent every time, in words, before every session and before every test. Each person is told that this is a study about forgetting rather than about them, what will happen to their answers, and that they may stop at any moment, refuse the second test, or ask for their answers to be destroyed, with no reason given and nothing said about it afterwards.
- Scores stay private. Everybody becomes a code before anything is written down; no name goes on an answer sheet, into a form or onto a chart; nobody sees anybody else's score; nobody is ranked, compared aloud, told they did badly or told who scored highest. The page linking codes to names stays with you, out of sight, and is destroyed when the project ends.
- Never test anybody on work they are being formally graded on. Choose a small neutral topic that touches no real mark anywhere, because a poor result here must never reach a report, a file or a mark book. The topic is never personal, religious or political, and no question asks about anybody's beliefs, family, income or ability.
- No pressure and no rewards that make refusal awkward. At the second test, ask again rather than assuming, and record anybody who declines as a withdrawal, removing their first score from the analysis and saying so in the report.

WHAT YOU USE - HIGH-TECH ROUTE

Google Forms - the five test questions built once and reused unchanged at both moments, with a participant-code box at the top and no name field anywhere

Google Sheets - the linked response sheet, the marking against the key, the per-person drop, the group means and the retained percentage in visible formula cells

Datawrapper, free plan - the two-line retention chart, one line per group, from the immediate score to the seventy-two-hour score

Google Docs - the ten-minute script word for word, the consent wording read aloud each time, the marking key and the one-page explainer

The clock and stopwatch already on the phone - timing each teaching session and fixing the second test at seventy-two hours to the hour

Google Drive - one folder for the study files and a separate, clearly marked place for the code-to-name page, which never sits with the scores

A free form delivers the identical five questions at both moments so nobody can be asked a different question the second time, a spreadsheet holds codes and scores with no names in it, and a free chart tool draws the two curves side by side.

Act 1 – find the problem steps 1 to 5, ending with a costed problem statement

1 Choose the ten minutes 40 MINUTES

Pick one small, self-contained, neutral thing you can teach completely in ten minutes, and write the script.

- List five candidate topics you could teach fully in ten minutes: a knot, the rules of a card game, how a lock works, the parts of a bicycle brake, five words of a language nobody in the room speaks.
- Strike out any topic that appears on somebody's syllabus this term, and any topic touching belief, politics, family or money.
- Write the ten-minute script word for word in Google Docs, including the examples and the exact order, so the second group hears the identical lesson.
- Read the script aloud against the phone stopwatch twice, and cut or pad until it lands between nine and eleven minutes both times.
- Write one sentence on why this topic is safe to test: it touches no mark, no belief and nobody's private life.

WRITE THIS DOWN

The chosen topic, the safety sentence, and the full script with both timed lengths recorded.

DONE WHEN

The script runs to time twice in a row and contains nothing about anybody's beliefs, family, ability or graded work.

Watch out. Choosing something you know well and improvising around the script. Improvisation means the two groups get different lessons, and then nothing you measure afterwards means anything.

2

Write the five questions 45 MINUTES**Build the test once, with its marking key, so it can be given twice without changing a word.**

- Write five short questions that can only be answered by somebody who received this lesson, one mark each, with no half marks anywhere.
- Write the marking key beside them, stating exactly what earns a mark and what does not, decided before a single answer exists.
- Build the questions once in Google Forms with a participant-code box at the top, no name field, and the question order fixed.
- Give the form to one person who has not had the lesson; their score tells you how much of your test can simply be guessed.
- Put both test moments in the calendar now: immediately after teaching, and exactly seventy-two hours later to the hour.

WRITE THIS DOWN

The five questions, the marking key, the form link, the untaught person's score, and the two fixed test moments.

DONE WHEN

Somebody who never had the lesson scores near zero, and the key decides every mark without you having to think.

Watch out. Writing questions answerable by common sense. If the untaught person scores three out of five, your test measures general knowledge rather than your lesson, so rewrite the questions before anybody is taught.

3

Ask and consent 40 MINUTES**Recruit at least five people, take consent in words, and give everybody a code instead of a name.**

- Find at least five people who can give you ten minutes now and five more minutes in three days, and ask each one face to face.
- Read the consent wording aloud to each person: this is a study about forgetting, not about you; your score is never shown to anyone; you can stop at any moment and I will destroy your answers.
- Give each person a code, tell them what it is, and write the code-to-name page separately from every other file.
- Record consent as a tick, a code and a date, and note that consent will be asked for again at the second test.
- Write one neutral line per person on things that could affect the result: how much of the topic they already knew, how comfortably they read, whether the lesson is in their first language.

WRITE THIS DOWN

The consent record by code and date, the code page kept apart, and the one-line profile of each participant.

DONE WHEN

Five or more people have consented aloud, hold a code, and know they can stop; no name sits anywhere near a score.

Watch out. Recruiting only the people who are good at tests because they are easy to ask. Write down who you asked and who declined, because a group of five willing friends is a limit you must report, not hide.

4

Teach and test now 45 MINUTES**Deliver the ten minutes from the script and test everybody immediately.**

- Teach from the script without adding examples, without answering extra questions, and time every session on the stopwatch.
- Hand out the form the moment the lesson ends, with no discussion in between and no talking between participants.
- Watch that each person enters their code rather than their name, and check the responses carry no names before you go further.
- Mark every answer against the key and enter the score against the code in Google Sheets.
- Tell everybody truthfully that there is nothing to revise and that they should carry on as normal.

WRITE THIS DOWN

The immediate score out of five for each code, the timed length of each session, and any deviation from the script.

DONE WHEN

Every code has a first score, the sessions ran within one minute of each other, and no name appears in the response sheet.

Watch out. Answering one good question during the lesson and giving that person extra content. Write the deviation down and report it rather than pretending the lesson was identical when it was not.

5

Test at seventy-two hours 40 MINUTES**Give the identical five questions again after exactly three days, unannounced, and measure the drop.**

- Wait the full seventy-two hours without reminding anybody, sending the material or discussing the topic in front of them.
- Ask each person again whether they are willing to be tested, and record anybody who declines as a withdrawal, removing their first score.
- Give the identical form, identical questions, identical order, and mark to the same key you wrote in step two.
- Ask each person one question afterwards and write the answer down: have you thought about this or talked about it since.
- Calculate the drop for each code, then the group means, then the second mean as a percentage of the first.

WRITE THIS DOWN

The second score per code, the per-person drop, the group mean at both moments, the retained percentage, and the real gap in hours for anybody who was not tested on time.

DONE WHEN

You can state one number aloud: the percentage of the immediate score still there after three days.

Watch out. Letting the gap slip to five days because somebody is busy. Test at seventy-two hours, or write the real gap in hours beside that person's score, because a mixed gap makes the two groups incomparable later.

Act 2 – fix it and measure steps 6 to 10, ending with a proven effect

6

Name the loss 50 MINUTES**Finish the costed problem statement on one page and choose the single change you will test.**

- Write five lines: who was taught, the immediate mean, the three-day mean, the percentage lost, and what that loss is worth in minutes of teaching per week and in hours or rupees per year at the rate teaching is actually paid for here.
- Draw the group's two points as one line in Datawrapper, labelled with the number of people and the exact gap in hours, titled with the finding rather than with the word 'chart'.
- List three possible changes: a two-minute recap at day one, one practice question at day one, the learner explaining the lesson back at the end, a written summary in their own words.
- Choose one and write the sentence: 'The second group gets X and nothing else changes; I expect retention to rise from A per cent to B per cent.'
- Write two lines underneath: what must stay identical for the comparison to hold, and the one difference between the groups you already know you will have to report.

WRITE THIS DOWN

The one-page costed problem statement, the three candidate changes, the chosen change as one testable sentence, and the known limit stated in advance.

DONE WHEN

Somebody who was not there reads the page once and repeats your percentage-lost figure back correctly.

Watch out. Changing the topic as well as the revision because the first lesson felt weak. One variable moves; if the lesson was weak, it stays exactly as weak for the second group.

7

Match the second group 40 MINUTES**Recruit and consent a second, comparable group of at least five, and record honestly how they differ from the first.**

- Recruit at least five people who had no contact with the first group's lesson and who have not heard the topic discussed.
- Read the same consent wording aloud, record consent by code and date, and give this group codes in a separate series so the two are never mixed up.
- Write the same one-line profile for each person: prior knowledge, reading comfort, language of the lesson.
- Set the two group profiles side by side and write down every way the groups are not alike, in a section titled 'limits' rather than buried in a footnote.
- Fix both test moments in the calendar and the exact moment the one change will be delivered.

WRITE THIS DOWN

The second group's consent record, profiles, the side-by-side comparison of the two groups, and the written list of differences.

DONE WHEN

Five or more people have consented, hold codes in a separate series, and the ways the groups differ are written down before any teaching happens.

Watch out. Claiming the groups are the same because they are the same size. Same size is not same group; write what actually differs and say plainly that it limits what you can conclude.

8

Teach group two 45 MINUTES**Deliver the identical ten minutes to the second group and test immediately with the identical questions.**

- Read the same script word for word, timed on the same stopwatch, adding nothing and answering no extra questions.
- Deliver the change here if the change belongs at teaching time, such as the learner explaining it back or writing a summary in their own words, and time that separately.
- Hand out the identical form the moment the lesson ends, with codes and no names.
- Mark against the same key, entering scores in the same sheet under the second group's codes.
- Compare the two immediate means and write one line on whether the groups started level; if they did not, say so now rather than at the end.

WRITE THIS DOWN

The second group's immediate score per code, the timed session length, the time taken by the change, and the comparison of the two immediate means.

DONE WHEN

Every code in the second group has a first score, and you have stated in writing whether the two groups started level.

Watch out. Teaching the second group better because you have had practice. Read the script; a lesson delivered more warmly the second time is a second variable you cannot separate out.

9

Change and retest 50 MINUTES ACROSS THREE DAYS**Deliver the change at the agreed moment, retest at seventy-two hours, and put the two curves side by side.**

- Deliver the change exactly as written and at the agreed hour, timing it and recording who received it and who was missed.
- Test at exactly seventy-two hours from the lesson, asking consent again and recording any withdrawal.
- Mark to the same key, then chart both groups in Datawrapper as two lines from immediate to seventy-two hours, each labelled with its number of people.
- State the difference in retained percentage between the groups as a number, and say plainly whether five people per group can settle it.
- List every confounder: different people, a different day of the week, one group taught in a noisier room, somebody who discussed the topic with a friend, a lesson that ran a minute long.

WRITE THIS DOWN

The second group's seventy-two-hour scores, both retained percentages, the two-line chart, the difference between them, and the confounder list.

DONE WHEN

You can state both retained percentages, the difference between them, and at least two reasons that difference might not be caused by your change.

Watch out. Reporting the difference as proof. With five people per group a difference can easily be the people rather than the method, so report the number and the uncertainty in the same breath.

10

Share and reflect 60 MINUTES**Publish the finding without naming anybody, defend it to real people, and record what you would keep.**

- Record a defence video of no more than three minutes: the topic, both groups, the two curves, the one change, the difference and the limits, using codes and never names.
- Show the one-page explainer to three people who teach or train and write down what each of them said.
- Send the two-line chart to the teacher or trainer you interviewed with one question: what would you have controlled that I did not.
- Tell every participant their own result privately if they want it, tell them nobody else has seen it, and destroy the code-to-name page in front of one witness.
- Complete the relations ledger with ten names, roles, dates and what each person replied.

WRITE THIS DOWN

The defence video, the one-page explainer, the note recording that the code page was destroyed, and the relations ledger holding ten logged relationships.

DONE WHEN

Ten relationships are logged with dates and replies, and no participant's score can be traced back to a name by anybody, including you.

Watch out. Showing the chart with a name or a recognisable description beside a low score. Codes only, in the video, the explainer and the ledger, with no exceptions for people who say they do not mind.

Your nine deliverables in this project**1 - RESEARCH - WEEK 2****Question card**

One card naming the ten-minute topic, how many people were taught and the gap in hours, and the question: how much survives seventy-two hours, and does one change to revision keep more.

2 - OUTREACH - WEEK 3**Expert interview pack**

Five written questions for a teacher, trainer, tutor or learning researcher, your first retention curve attached as one page, the date and channel of the request, and the reply recorded word for word.

3 - RESEARCH - WEEK 4**Evidence log**

The script, the five questions, the marking key written before any answer, the consent record by code and date, every score against its code, and the exact gap in hours for every person tested.

4 - PROCESS - WEEK 5**Failure log**

The person tested at ninety hours instead of seventy-two, the withdrawal, the lesson that ran twelve minutes, the participant who discussed the topic with a friend, and what each did to the comparison.

5 - DESIGN - WEEK 5

The build

The study instrument itself - script, five questions, marking key and consent wording - together with the two-line retention chart running from the immediate score to the seventy-two-hour score for both groups.

6 - DESIGN - WEEK 5

One-page explainer

One page a stranger reads in ninety seconds: the topic, the percentage lost in three days, the one change, the second group's result, the difference, and what a study this small cannot tell anybody.

7 - BRANDING - WEEK 5

Identity card

A name and a one-line promise for the revision method you tested, so a teacher can ask for it by name, plus the single sentence you want repeated by somebody who has just finished teaching.

8 - OUTREACH - WEEK 6

Relations ledger

Ten names with dates and replies: one teacher, trainer or learning researcher, three people the forgetting affects, three peers who checked your key, and three people you sent the chart to who answered.

9 - DEFENCE - WEEK 6

Defence video

Under three minutes on camera, using codes and no names: the topic, both groups, both retention curves, the one change, the difference, and the limits of five people per group accepted without argument.

The four tiers, in this project

Starter

You teach the same ten minutes to five people, test them immediately and again at seventy-two hours with the identical five questions, and report the percentage lost with everybody's consent recorded.

Practitioner

You choose and defend your own topic and sample, write the marking key before any answer exists, cite anything you borrowed, and produce one chart a stranger reads correctly without you explaining the axes.

Researcher

You write the whole protocol before teaching, justify five people and seventy-two hours rather than fewer or longer, and quantify what a single marker, a small group and volunteer recruitment do to your result.

Contributor

You set your retention figures against published work on spaced revision, defend your controls to a specialist who disagrees, and publish the script, the questions, the key and the anonymised scores openly.

The one expert you must talk to

Who. A teacher, a corporate or vocational trainer, a private tutor or a learning researcher - somebody who has to make material stick and finds out when it does not.

Where to find one. Any nearby school or college staff room at the end of the day, asked through the office. Training departments at hospitals, banks and factories employ trainers who run the same course repeatedly. University education departments publish staff emails. A private tutor who has taught the same material for years will answer the retention question faster than anybody.

SEND EXACTLY THIS

Hello, my name is [name]. I taught five people the same ten minutes and tested them straight away and again three days later. A large part of it had gone, and the number surprised me. Could you spare fifteen minutes this week to tell me what I measured wrongly? I will send my five questions first.

Ask them

1. When you teach something once, how much do you expect to be there three days later, and what makes you think that?
2. What do you do differently for the material you cannot afford to have forgotten?
3. How would you check whether your teaching worked, if nobody gave you a test to use?
4. What makes a test question a fair test of a lesson rather than a test of general knowledge?
5. If you had two small groups and one change between them, what would you be most worried about in the comparison?

You will be asked, without warning

1. Would the second group have remembered more anyway without your change, and how do you know?
2. Your two groups were different people. Name every way they differed and tell me which difference could have produced your whole result on its own.
3. Five people per group. Convince me that is enough to say anything, and tell me what number would have satisfied you.
4. Somebody in the second group says they thought about the topic on day two. What does that do to your finding, and what did you do about it?

If you get stuck

- If nobody will be taught by you - then teach the ten minutes to people who already owe you five minutes, such as the family you live with and one neighbour, and report plainly that a convenience sample is what you had.
- If your two groups look the same - then report the null result, check first whether the change was actually delivered to every person and at the agreed hour, and put the delivery record beside the chart.
- If you could not test at seventy-two hours - then record the real gap in hours for every person, use the same real gap for the second group, and report the gap you used rather than the gap you meant to use.
- If you run out of time - then keep both groups and shorten nothing about the method, dropping the third teaching session or the stretch rather than the seventy-two-hour test, because without the second test there is no finding at all.

Finished early?

Run a third group with a second revision change and put all three curves on one axis, keeping every other condition identical.

Where The Money Actually Went

Write down what you think you spend, seal it, log every rupee for fourteen days, then compare.

THE QUESTION

How many rupees a week actually leave one small purse, and in which category is the gap between what somebody believed and what really happened the largest?

A shop that cannot say where its cash went is one bad month from closing, and a household that cannot say it argues about the wrong thing. Bookkeepers, accountants, bank staff, microfinance officers and fintech product teams all earn their living from the same two moves you make here: capture an outflow at the moment it happens, then sort it into a category somebody else can audit. The gap between what people believe they spend and what they actually spend is the entire reason budgeting products exist, and you get to measure that gap on a real purse before anyone tries to sell you one.

ACT 1 - FIND

You track every rupee leaving one small purse for fourteen days - your own pocket money, a household grocery float, or a small shop's daily till logged with the owner's written permission - recording the amount, the category and who decided it, at the moment the money goes. On day one, before a single row exists, the person who holds that purse writes down what they believe leaves it in a normal week, and that page is sealed and not looked at again until day fourteen.

A one-page costed problem statement carrying four lines: whose purse this is, total rupees out per week, the category where the believed figure and the actual figure differ most, and what that gap comes to per year at this rate. Beside it sits a bar chart of rupees per week by category, guessed bar against actual bar, largest gap first.

ACT 2 - FIX

You change exactly one thing - a written limit on one category, a separate envelope for one category, one category logged where everybody can see it, or one habit dropped - and you leave the categories and the logging method untouched. You then log fourteen more consecutive days under the identical rule, so the only moving part is the change you named.

Two fortnights set side by side per category in rupees per week, a paired bar chart of before against after, the difference in rupees per week and per year, a named list of confounders, and the purse holder's recorded answer on whether the change stays.

YOU MEASURE

rupees leaving one purse per week, split by category

BEFORE

Fourteen consecutive days of logging every outflow from one purse at the moment it happens, each row carrying the amount, the category, the decider written as a role rather than a name, and what it was for. Totalled by category and divided by two for rupees per week, then set against the weekly figure the purse holder wrote down and sealed on day one, unopened until day fourteen.

AFTER

Fourteen more consecutive days logged from the same purse with the same categories, the same log, the same at-the-moment rule and the same fourteen-day length, beginning the day after the change starts, reported in rupees per week per category beside the first fortnight.

Safety and ethics - not optional

- You never handle money that is not yours. You are logging what leaves a purse, not carrying it, spending it or holding it - if the purse belongs to somebody else, they move every rupee and you write the row.
- Nobody's spending is logged without their explicit permission, asked again every time you log, and the log stops the day they ask it to stop, without them having to give a reason. A shop till is logged only with the owner's written permission, and the shop is never named in anything you publish.
- Nothing that identifies an account goes anywhere near this project. No card numbers, no account numbers, no PINs, no passwords, no photographs of cards or statements - not in the log, not in the chart, not in the video, not in a screenshot. Nobody's income is written down or published; you record only what left the purse.
- The optional needed, chosen and neither split applies to your own spending and to nothing else. Do not sort another person's outflows into it, do not write it up as a judgement of anybody, and if anything in the log would embarrass the person who holds the purse, it comes out of the shared version before it is shared.

WHAT YOU USE - HIGH-TECH ROUTE

Google Forms - a four-question form saved to the phone home screen, so one outflow takes about ten seconds to record and the time is stamped by the form rather than remembered by you

Google Sheets, or LibreOffice Calc where there is no account - the linked log holding one row per outflow, with a category column and the weekly totals in visible formula cells

SUMIF and the pivot table inside your spreadsheet - rupees totalled by category, by week and by decider role, with the formula left visible so a stranger can check it rather than trust it

The chart editor built into your spreadsheet - the rupees-per-week-by-category bar chart and the paired before-and-after bars

Google Docs, or any plain text editor - the day-one guess, the protocol, the evidence log, the failure log and the one-page explainer

Google Drive - dated folders holding the signed permission page and the guess file, whose version history proves the guess predates the log

A free form on your phone home screen stamps every outflow the moment it happens, the rows land in a free spreadsheet, and that one spreadsheet totals by category and draws the chart without a second tool or a second login.

Act 1 - find the problem steps 1 to 5, ending with a costed problem statement

1

Choose the purse 40 MINUTES

Pick the one purse you will track for twenty-eight days and get written permission if it is not your own.

- Choose one of three: your own pocket money, a household grocery float, or a small shop's daily till.
- Write one sentence defining an outflow: any money leaving that purse, of any amount, including coins and including money spent for somebody else.
- Where the purse is not yours, ask the holder face to face and write their permission on a dated page they sign, stating plainly that they may stop the log on any day without giving a reason.
- Where it is a shop till, ask the owner for that same permission in writing, and write on the same page that the shop will never be named in anything you publish.
- Photograph the signed page and file it in a dated Google Drive folder, then open a Google Sheets file named 'Where The Money Went'.

WRITE THIS DOWN

The purse chosen, the one-sentence definition of an outflow, and the signed, dated permission page.

DONE WHEN

You can state in one sentence which purse you are logging, and where it is not yours a signed permission page exists carrying today's date.

Watch out. Choosing a purse you only see once a week. Every outflow has to be caught at the moment it happens, so pick the purse that is in the room with you.

2

Seal the guess 30 MINUTES**Get the guess written down before a single rupee is logged.**

- Ask the person who holds the purse to write what they think leaves it in a normal week: one total, then a figure against each of your categories.
- Write your own separate guess in the same shape, even where it is your own purse and your own money.
- Put both in a Google Doc named 'Day one guess', close it, and do not open it again until day fourteen.
- Open File then Version history once, so the file itself carries the creation date rather than your word for it.
- Write today's date and the words 'not to be opened until' plus the day-fourteen date at the top of the log sheet.

WRITE THIS DOWN

Two guesses - the purse holder's and your own - each with a weekly total and a figure per category, both dated.

DONE WHEN

The guess file exists, carries a timestamp neither of you can edit away, and is closed.

Watch out. Guessing after you have started logging. A guess written on day three is not a guess, and the whole finding rests on this file predating the data.

3

Build the log 40 MINUTES**Build a form and a sheet that record one outflow in under fifteen seconds.**

- Write your category list on one page, between six and ten categories, each one a thing a stranger could sort a purchase into without asking you.
- Build a Google Form with four questions: amount in rupees, category chosen from your list, who decided it as a role rather than a name, and one line on what it was for.
- Link the form to the sheet so every submission lands as a row with the time stamped automatically.
- Save the form to your phone home screen and test it with three invented rows, then delete those three rows before day one begins.
- Add a column headed 'estimated' and tick it for any amount you had to reconstruct rather than see.

WRITE THIS DOWN

The category list, the four form questions, and the empty linked sheet with its column headings.

DONE WHEN

You submit a test entry from the home screen in under fifteen seconds and it appears in the sheet as one timestamped row.

Watch out. Building fifteen categories because every purchase feels different. Above ten you start guessing which one a row belongs in, which puts your own noise inside the finding.

4

Log fourteen days 10 MINUTES A DAY FOR FOURTEEN DAYS**Record every outflow from that purse at the moment it happens, for fourteen consecutive days.**

- Open the form and submit the row before the money is out of your hand, not later that evening.
- Where you genuinely could not log at the moment, enter it the same day and tick the estimated column.
- Record the decider as a role - me, the purse holder, another member of the household, the shop owner - and never as a name.
- Enter a day with nothing spent as a row saying zero, so that day exists in the count.
- Write one line each night in the failure log: anything missed, anything reconstructed, anything you were told about after the event.

WRITE THIS DOWN

One row per outflow with amount, category, decider role, purpose and timestamp, plus fourteen nightly failure-log lines.

DONE WHEN

Fourteen consecutive dates appear in the sheet, including the days with nothing on them, and no row has a blank amount.

Watch out. Leaving the small ones out. Tea, a bus fare, a top-up and a packet of biscuits are exactly where the invisible weekly total hides, so log every amount, down to single rupees.

5

Total by category 60 MINUTES

Total the fortnight by category, then open the sealed guess and measure the gap.

- Use SUMIF, or insert a pivot table, to total rupees against each category across the fourteen days, then divide by two for rupees per week.
- Build one bar chart in the chart editor: rupees per week by category, largest bar first, titled with the finding rather than the word 'chart'.
- Only now open the day-one guess and put the guessed figure beside the actual figure for every category, in two columns.
- Calculate the gap in rupees per week for every category and sort by that gap, largest first.
- Optional, and only if you want it: add two columns marking each of your own outflows as needed, chosen or neither, and a note on whether anything carried interest or a late fee. This is your own reflection on your own spending, never a verdict on anybody else's.

WRITE THIS DOWN

Rupees per week per category, the guess beside it, the gap per category, and the name of the category carrying the largest gap.

DONE WHEN

You can say one sentence aloud: we thought X rupees a week went on this category and it was actually Y.

Watch out. Reporting only the biggest category. The finding is the biggest gap, not the biggest total - the category everybody already knew about is not news.

Act 2 – fix it and measure steps 6 to 10, ending with a proven effect

6

Name the cost 50 MINUTES

Finish the costed problem statement on one page and choose the single change you will make.

- Write four lines: whose purse this is, total rupees out per week, the category with the largest gap between believed and actual, and what that gap comes to per year at this rate.
- Put the guessed bars beside the actual bars on one axis and give the chart the finding as its title.
- List three candidate changes - a written limit on one category, a separate envelope for one category, one category logged where everybody can see it daily, or one habit dropped - with the rupees each might save.
- Choose one and write the sentence: for fourteen days I will change X and expect this category to fall from A to B rupees per week.
- Read the page to the purse holder and record their agreement as a dated note or a voice message before anything changes.

WRITE THIS DOWN

The one-page costed problem statement, the three candidate changes with predicted savings, and the chosen change as one testable sentence.

DONE WHEN

Somebody who was not there reads the page once and repeats your gap figure back correctly.

Watch out. Choosing the change that saves most on paper but nobody will keep. A change abandoned on day three measures nothing - choose the one that survives fourteen days.

7

Write the rules 40 MINUTES**Write the protocol that keeps the second fortnight measurable against the first.**

- Write what stays fixed: the same purse, the same categories, the same form, the same at-the-moment rule, the same fourteen days.
- Write what is allowed to move: only the one change you named in step six.
- Write the change itself as an instruction somebody could follow without you in the room, and pin it where the purse lives.
- Add fourteen blank dated rows on a second sheet tab before any data exists.
- Record a thirty-second voice note stating your prediction, and file it in the dated folder.

WRITE THIS DOWN

The protocol as a numbered list, the change written as an instruction, the fourteen dates, and the timestamped prediction.

DONE WHEN

The second tab holds fourteen empty dated rows and the prediction exists before the data does.

Watch out. Renaming the categories between fortnights because the first set annoyed you. Fix them now; one category renamed halfway makes the two fortnights uncomparable.

8

Log week one 10 MINUTES A DAY FOR SEVEN DAYS**Run the change and log the first seven days exactly as you logged the baseline.**

- Submit every outflow through the same form, at the moment it happens, into the second fortnight's rows.
- Total these seven days by category and compare them against the matching seven days of the baseline rather than against the whole fortnight.
- Write down every occasion the change was not kept, and why, without softening it.
- Ask the purse holder once, on day seven, whether the change is annoying, and write the answer word for word.
- Do not alter the change mid-week; where it turns out to be unworkable, write that down and keep logging.

WRITE THIS DOWN

Seven days of rows, the seven-day category totals, and a dated failure entry for every day the change slipped.

DONE WHEN

Seven consecutive dates exist in the second fortnight and the failure log holds at least one honest entry.

Watch out. Quietly loosening the change when it starts to pinch. Log the slip - a change kept nine days out of fourteen is a real result, and a change you pretend was kept is not.

9

Days eight to fourteen 10 MINUTES A DAY FOR SEVEN DAYS, PLUS 45 MINUTES**Finish the second fortnight and compare the two fortnights honestly.**

- Log the remaining seven days with nothing altered.
- Total the second fortnight by category and set it beside the first, per week, in the same two-column shape you used for the guess.
- Chart before against after in the chart editor: one pair of bars per category, largest change first.
- List every confounder you can name: a wedding, a festival, a price rise, a guest, an illness, a different pay date, and the fact that logging money tends to reduce it on its own.
- State the change in rupees per week and as a percentage, and say plainly whether twenty-eight days is enough to be sure.

WRITE THIS DOWN

The paired before-and-after chart, the difference in rupees per week and per year, and the named confounder list.

DONE WHEN

You can state the before figure, the after figure, and at least two reasons the difference might not be your doing.

Watch out. Reporting the good week and burying the other. Report both weeks, including the one that went backwards - a well-measured failure outscored an unmeasured success.

10

Share and reflect 60 MINUTES**Publish the finding, defend it to real people, and record what the purse holder will keep.**

- Record a defence video of no more than three minutes: the purse described without naming anyone, the weekly total, the gap, the change, the result and the limits.
- Check the video and every page for card numbers, account numbers, anybody's income, and the shop's name where a shop was involved, and remove all of it before anything is shared.
- Show the one-page explainer to three people this purse actually pays for, and write down what each of them said.
- Send the chart to the expert you interviewed with one question: what would you have categorised differently.
- Complete the relations ledger with ten names, roles, dates and what each person replied.

WRITE THIS DOWN

The defence video, the one-page explainer, and the relations ledger holding ten logged relationships.

DONE WHEN

Ten relationships are logged with dates and replies, nothing identifying survives in the shared version, and the purse holder has said on record whether the change stays.

Watch out. Sharing a screenshot of the raw log. The rows are evidence for the assessor, not for the internet - publish the category totals and keep the rows in the evidence file.

Your nine deliverables in this project**1 - RESEARCH - WEEK 2****Question card**

One card naming the purse, the fourteen days and the category list, and the question: how many rupees a week leave this purse, and where is the gap between belief and reality largest.

2 - OUTREACH - WEEK 3**Expert interview pack**

Five written questions for a shopkeeper, accountant, teller or microfinance officer, your category totals attached as one page carrying no names or account numbers, the date of the request, and the reply word for word.

3 - RESEARCH - WEEK 4**Evidence log**

Every outflow with its date, time, amount, category and decider role, the sealed day-one guess with its timestamp, and a tick against every reconstructed amount. No card or account numbers, no income figures.

4 - PROCESS - WEEK 5**Failure log**

The outflows you caught late, the days the change was not kept, any category you renamed, the week a festival broke the pattern, and what each did to the comparison, all dated.

5 - DESIGN - WEEK 5**The build**

The logging system itself: the form and linked sheet, or the daily card and the envelope, with the category list and the paired before-and-after chart of rupees per week per category.

6 - DESIGN - WEEK 5**One-page explainer**

One page read in ninety seconds: the purse, the weekly total, the guessed figure beside the actual one, the single change, the fortnight result, and what twenty-eight days cannot tell anybody.

7 - BRANDING - WEEK 5**Identity card**

A name and a one-line promise for the log, so the household or the shop can refer to it by name, plus the single sentence you want repeated at somebody else's table.

8 - OUTREACH - WEEK 6**Relations ledger**

Ten names with dates and replies: one shopkeeper, accountant, teller or microfinance officer, three people this purse pays for, three peers who checked your arithmetic, and three people you sent the chart to who answered.

9 - DEFENCE - WEEK 6**Defence video**

Under three minutes on camera: the purse without naming anybody, the weekly total, the largest gap, the single change, the fortnight result, and the limits you accept without argument. No account details on screen.

The four tiers, in this project

Starter

You log every outflow from one purse for fourteen days without a gap, total it by category, open the sealed guess, and put your questions to one stranger who handles money for a living.

Practitioner

You choose and defend your own category list, cite any borrowed budgeting method to its source, and produce one chart a stranger reads correctly without you explaining what the two bars mean.

Researcher

You write the categories and the recording rule before day one, justify fourteen days rather than seven, and quantify how much of the outflow you probably missed and which way that biases the gap.

Contributor

You set your gap against published work on how far people misjudge their own spending, defend your categories to an accountant who disagrees, and publish the anonymised totals openly so anybody can recompute them.

The one expert you must talk to

Who. A shopkeeper who keeps a daily cash book, an accountant or bookkeeper, a bank teller, or a microfinance loan officer - anybody who sees where other people's money actually goes and has to sort it into categories for a living.

Where to find one. Go to a shop that has been on the same street for years and ask in the quiet hour after opening. Microfinance branch offices sit in most towns and a loan officer will usually answer two questions at the counter. Search LinkedIn for 'accountant' or 'bookkeeper' plus your city. A college commerce department will name a lecturer who has done real books, and any bank branch has a teller between customers mid-morning.

SEND EXACTLY THIS

Hello, my name is [name]. I logged every rupee leaving one purse for fourteen days, and the total came out very different from what we thought we spent. I would like to know whether my categories are the ones you would use. Could you spare fifteen minutes this week? I will send five questions first.

Ask them

1. When you write down a day's spending, which categories do you actually use, and why those ones?
2. How far out are people usually when they guess their own weekly spending, and in which direction?
3. Which kind of spending do people forget to record most often, in your experience?
4. What is the simplest record-keeping change you have seen actually stick for more than a month?
5. If you had my fourteen days of rows, what one column would you have asked me to record that I did not?

You will be asked, without warning

1. Would that fall in weekly spending have happened anyway without your change, and how do you know?
2. Logging money tends to reduce it on its own. How much of your Act 2 result is the change and how much is simply being watched?
3. You logged twenty-eight days. Which weeks of the year would have given you a completely different answer, and why?
4. Your category list decided your finding. Show me two outflows that could honestly have gone in either of two categories, and tell me what that does to your gap figure.

If you get stuck

- If nobody replies to your interview requests - then stop writing and go to a shop that has stood on the same street for years, at the quiet hour, and ask the person behind the counter two questions while they work.
- If your before and after look the same - then report that as the finding, check the daily rows to see whether the change was actually kept on all fourteen days, and look for the category that grew while your target category shrank.
- If you could not catch every outflow - then log one category completely rather than all of them badly, state on every chart that the figure covers that category only, and mark every reconstructed amount as estimated.
- If you run out of time - then keep both fortnights at fourteen days and drop the optional needed-and-chosen columns rather than the log, writing on the page what you dropped and why.

Finished early?

Run the same fourteen-day log on a second purse in a different household and set the two category charts side by side, per week, with no names on either.

The Rule Nobody Follows

Count how often one real rule near you is actually kept, then find out who pays for the breaking.

THE QUESTION

How often is one real rule in a place you already belong actually followed, and who carries the cost, in minutes or rupees, when it is not?

A rule that most people break is not a small annoyance; it is a cost quietly moved onto whoever is least able to refuse it. Regulators, compliance teams, councils, unions and housing committees all live on the same two moves you make here: count how often a rule is actually followed, then find out who pays when it is not. Writing a rule that the people bound by it agreed to, can appeal against and can change is the whole difference between governance and an instruction nobody obeys, and that difference is paid work everywhere from a market committee to a national regulator.

ACT 1 - FIND

You pick one real rule in a place you already belong - a household, a shared room, a street, a sports ground, a bus queue - that most people break, and you count it: ten observation sessions across two weeks, always at the same time, in the same place, for the same fixed length, every instance tallied as followed or not followed. You then ask at least five people whom the breaking affects what it costs them in minutes, rupees, safety or fairness, and turn those answers into a figure per week.

A one-page costed problem statement carrying four lines: the rule written as an observable event, the compliance rate as a percentage with the number of instances behind it, who carries the cost of the breaking, and what that cost comes to per week. Beside it sits a bar chart of compliance per session and one line quoting, without naming anybody, what the people who pay actually said.

ACT 2 - FIX

You draft a changed rule, put it to everybody it affects, and rewrite it until they agree - the signed sheet carries the rule, the way to change it, the way to appeal a decision under it, and the plain statement that anybody may leave the group at any time. You then count compliance for two more weeks under the identical method: same sessions, same times, same place, same length, same tally sheet, same counter.

The signed rule sheet, ten more sessions counted identically, the two compliance rates side by side as a bar chart with the instance count on each bar, the change in percentage points, the weekly cost recalculated, and a named list of confounders. Where the group refused the new rule, that refusal, its reasons and what it says about the original rule stand as the result and are written up as one.

YOU MEASURE

compliance rate for one rule, as a percentage of observed instances

BEFORE

Ten observation sessions across two weeks, each at the same time, in the same shared or public place, for the same fixed length, every instance tallied as followed or not followed by the same counter. The rate is instances followed divided by total instances, reported per session and as a two-week figure with the total instance count written beside it. Taken before anything is proposed to anybody.

AFTER

Ten more sessions across two weeks, same times, same place, same length, same tally sheet, same counter and the same definition of an instance, beginning the day after the new rule is signed, reported per session and as a two-week figure beside the first.

Safety and ethics - not optional

- You count in shared or public places only - a shared room, a corridor, a street, a queue, a ground. Never observe anybody in a private space: not through a window, not in a bedroom or a bathroom, not in a home you were not invited into, and never on a camera, a photograph or a recording of any kind.
- Observation is counting, not policing. You never confront, correct, warn or film a person breaking the rule, and you never wait somewhere in order to catch somebody. Where anybody asks what you are doing, tell them plainly, and stop counting if they ask you to.
- No named complaints, ever. Every note describes a situation and never a person - the bin was left out overnight, two people went ahead of the queue - not by name, not by description, not by relationship, not by where they sit. Anything already written that identifies somebody is crossed out before the page leaves your hand.
- The new rule may not punish, shame, exclude, fine or cost anybody money, and it may not name a single person. It must carry a way to change it, a way to appeal a decision under it, and the plain sentence that anybody may leave the group at any time. Where everybody affected does not agree to it, it is not written into force: the refusal is the result and you write it up as one.

WHAT YOU USE - HIGH-TECH ROUTE

Google Docs - the rule sheet, shared with everybody affected in suggestion mode so their objections and your replies stay visible as evidence that consent was asked for and given

Google Sheets, or LibreOffice Calc where there is no account - one row per session holding date, start time, instances followed, instances not followed, and the rate in a visible formula cell

COUNTIF and SUM inside your spreadsheet - the two-week totals, the compliance rate, and the split by day of the week

The chart editor built into your spreadsheet - the simple bar chart of compliance per session and the paired before-and-after bars with the instance count on each

Google Forms - the five-question cost survey for the people the breaking affects, collecting no names and landing straight in the same spreadsheet

The clock and stopwatch already on your phone - holding every session to the identical length and timing the minutes the breaking actually costs

A shared document carries the rule and collects everybody's objections before a single signature goes on it, a free spreadsheet holds the session tally and works out the rate, and one bar chart puts the two fortnights beside each other.

Act 1 - find the problem steps 1 to 5, ending with a costed problem statement

1 Find the rule 40 MINUTES

Pick one real rule in a place you already belong that most people break, and write it as something a stranger could observe.

- List five rules you already live under: at home, in a shared room, on your street, at a ground, in a queue.
- Cross out any rule you cannot watch from a shared or public place, and any that would mean watching one particular person.
- Write the survivor in one sentence: the rule is X, one instance is Y, and an instance counts as followed when Z.
- Find out whether it is written anywhere, and copy the written version into a Google Doc; where it exists only as something people say, write down who says it and when it started, as far as anybody can tell.
- Ask three people who live under it whether they knew it existed, and write down all three answers.

WRITE THIS DOWN

The rule in one sentence, the definition of one instance, whether it is written down anywhere, and three people's answers on whether they knew of it.

DONE WHEN

Somebody who has never been to the place reads your sentence and says correctly whether a described instance followed the rule.

Watch out. Choosing a rule about one person you find annoying. That is a complaint, not a rule - pick something that happens many times a day to many people.

2

Define the count 45 MINUTES

Fix the time, the place, the session length and the counting rule, then run one pilot session.

- Choose one fixed time of day and one fixed shared or public place where instances happen often enough to count.
- Choose a fixed session length between ten and thirty minutes and write it down; every session from now on is exactly that long.
- Build the Google Sheet with one row per session: date, start time, instances followed, instances not followed, rate as a formula.
- Run one pilot session with a paper tally, timed on your phone clock, and mark that row clearly as a pilot so it never enters the ten.
- Write the edge cases the pilot exposed - an instance half-done, two at once, one you could not see clearly - and fix the answer to each before session one.

WRITE THIS DOWN

The fixed time, place and session length, the edge-case rules, and the pilot counts marked as a pilot.

DONE WHEN

The pilot count exists, the edge-case rules are written, and the sheet holds ten empty dated rows waiting.

Watch out. Counting for as long as it stays interesting. Sessions of unequal length cannot be compared, so set the timer and stop when it goes.

3

Count ten sessions 20 MINUTES A DAY ACROSS TWO WEEKS

Run ten identical observation sessions and tally every instance.

- Turn up at the same time and the same place for every session, and start counting when the timer starts, not before.
- Mark one stroke in followed or not followed for every instance, and nothing else - no names, no descriptions, no photographs.
- Enter both totals into the sheet the same day, so the rate calculates itself while you still remember the session.
- Where a session could not happen, write the date and the reason in the failure log rather than moving that session to another time.
- Where anybody asks what you are doing, say plainly that you are counting how often a rule is followed for a project, and stop if they ask you to.

WRITE THIS DOWN

Ten rows with date, start time, both counts and the rate, plus a failure-log line for every session that went wrong.

DONE WHEN

Ten sessions of identical length exist, each with a total instance count beside its rate, and no note anywhere identifies a person.

Watch out. Counting harder on the days you expect breaking. The count has to be blind to what you hope for, so keep the time, the place and the length fixed even when it is dull.

4

Ask who pays 60 MINUTES**Find out who carries the cost of the breaking, and in what.**

- List everybody the breaking affects: whoever clears up, whoever waits, whoever pays, whoever is made less safe.
- Build a five-question Google Form asking what the breaking costs them - minutes lost, rupees spent, something made less safe, something made less fair, and one line in their own words - and collect no names.
- Ask at least five of them, face to face wherever you can, and write their answers into the same spreadsheet.
- Where the cost is minutes, time it yourself once with the phone stopwatch rather than trusting the estimate.
- Write down anybody who says it costs them nothing, because that answer matters as much as the rest.

WRITE THIS DOWN

Five or more answers giving the cost in minutes, rupees or a stated harm, and at least one cost you timed yourself.

DONE WHEN

You can name who pays for the breaking without naming a person, and there is a figure or a timed measurement behind it.

Watch out. Asking only the people who complain. Ask the people who break the rule what it costs them to follow it, or your changed rule will fail for a reason you never saw coming.

5

Price the breaking 45 MINUTES**Turn the compliance rate and the answers into a cost per week.**

- Multiply instances not followed per session by the number of sessions in a week, in a visible formula cell, to get instances not followed per week.
- Multiply that by the minutes or the rupees one instance costs, taken from the answers and from your own timing.
- Where the cost is safety or fairness rather than money, write it as a count of instances plus one sentence in the words the affected people used, and do not invent a rupee figure for it.
- Build one bar chart of compliance per session across the ten sessions, with the two-week rate drawn across it as a line.
- Write the limits: how many instances you saw in total, how many you might have missed, and what a different hour of the day would probably have shown.

WRITE THIS DOWN

Instances not followed per week, the cost per week in minutes or rupees, the per-session compliance chart, and the stated limits.

DONE WHEN

You can say one sentence aloud: the rule is followed X per cent of the time, and the breaking costs whoever pays Y a week.

Watch out. Putting a rupee figure on unfairness because a number looks stronger. Count what you counted, and say in words what you could not.

6 Name the cost 60 MINUTES

Finish the costed problem statement and draft the changed rule everybody will be asked to agree to.

- Write four lines: the rule, the compliance rate with the instance count behind it, who carries the cost, and the cost per week.
- List three candidate changes - make the rule easier to follow, move where or when it applies, change what it asks for, or drop it because nobody ever consented to it - with what each would need from whom.
- Draft the changed rule in a Google Doc as one short page: the rule, why it exists, how to change it, how to appeal a decision under it, and the sentence that anybody may leave this group at any time.
- Check the draft against the hard line: it may not punish, shame, exclude, fine or cost anybody money, and it may not name a person. Rewrite anything that does.
- Write the prediction: compliance will move from A per cent to B per cent across two weeks.

WRITE THIS DOWN

The one-page costed problem statement, the three candidate changes, the drafted rule sheet, and the dated prediction.

DONE WHEN

Somebody who was not there reads the page once and repeats your compliance rate and the weekly cost back correctly, and the draft breaks none of the four bans.

Watch out. Writing the rule you want rather than the rule people will agree to. A rule imposed is obeyed for two weeks and ignored for ever after.

7 Agree the rule 50 MINUTES

Put the draft to everybody it affects, rewrite it until they agree, and get it signed.

- Share the Google Doc in suggestion mode with everybody affected, or read it aloud to anybody who is not online, and ask each of them for one objection.
- Change the rule to answer at least one objection, and keep the comment history showing what changed and why.
- Ask each person to sign and date the final page, and record how many declined as a number, without naming any of them and without pressing anybody for a reason.
- Say aloud, and write on the sheet, that anybody may ask to change it, may appeal a decision under it, and may leave the group at any time.
- Pin the signed sheet where the rule applies and photograph it for the evidence log.

WRITE THIS DOWN

The signed rule sheet, the list of objections and what each one changed, and the number of people who declined.

DONE WHEN

Everybody affected has either signed or declined on the record, and at least one objection visibly changed the wording.

Watch out. Counting silence as agreement. Somebody who did not answer has not consented, and where the group as a whole refuses, that refusal is your finding and you write it up as one rather than coming back with a softer version.

8

Count week one 20 MINUTES A DAY ACROSS ONE WEEK**Run five sessions under the new rule, changing nothing about how you count.**

- Keep the same time, the same place, the same session length, the same tally sheet and the same counter.
- Count five sessions and enter both totals into the sheet the same day.
- Write down every occasion the rule was not kept as a situation, never as a person.
- Ask two people on day seven whether the new rule is workable, and write their answers word for word without naming them.
- Do not remind anybody of the rule during a session; a count you influenced is not a count.

WRITE THIS DOWN

Five rows with both counts and the rate, plus a dated failure entry for every session that did not go to plan.

DONE WHEN

Five identical sessions exist in the second fortnight and the failure log holds at least one honest entry.

Watch out. Standing somewhere new so people notice you counting. Stand where you stood in the baseline, doing exactly what you did then, or the two fortnights are not comparable.

9

Count week two 20 MINUTES A DAY ACROSS ONE WEEK, PLUS 45 MINUTES**Finish the ten sessions and compare the two fortnights honestly.**

- Run the last five sessions with nothing altered.
- Calculate the second fortnight's rate and set it beside the first, in percentage points, with the total instances behind each.
- Chart the two rates as paired bars in the chart editor, with the number of instances written on each bar.
- Recalculate the cost per week at the new rate and state the difference in minutes or rupees.
- List every confounder: a holiday, an examination week, the weather, a new person in the group, the fact that people knew they were being counted, and the fact that you asked them to sign something.

WRITE THIS DOWN

The paired before-and-after chart, the change in percentage points, the recalculated weekly cost, and the named confounder list.

DONE WHEN

You can state the before rate, the after rate, the instance count behind both, and at least two reasons the difference might not be your doing.

Watch out. Reporting a rate without its denominator. Eighty per cent of five instances and eighty per cent of two hundred are not the same finding, so put the instance count on every bar.

10

Share and reflect 60 MINUTES**Publish the finding, defend it to the people it affects, and record what happens to the rule now.**

- Record a defence video of no more than three minutes: the rule, the baseline rate, who paid and how much, the changed rule, the after rate and the limits.
- Read every page and watch the video for anything that identifies a person, and take it out before anything is shared.
- Show the one-page explainer to three people the breaking costs, and write down what each of them said.
- Send the chart to the expert you interviewed with one question: what would you have written into the rule that I did not.
- Ask the group on the record whether the rule stays, changes again or ends, and write the answer down as they said it.

WRITE THIS DOWN

The defence video, the one-page explainer, the group's recorded decision on the rule, and the relations ledger holding ten logged relationships.

DONE WHEN

Ten relationships are logged with dates and replies, nothing identifying a person survives in the shared version, and the group has said on record what happens to the rule.

Watch out. Calling it a success because the rate went up. Say who still pays at the new rate, and by how much, before you say anything else.

Your nine deliverables in this project

1 - RESEARCH - WEEK 2

Question card

One card naming the rule, the place, the fixed session time and length, and the question: what share of instances actually follow this rule, and who carries the cost of the ones that do not.

3 - RESEARCH - WEEK 4

Evidence log

Twenty dated tally sheets or rows with start times, session lengths and both counts, the cost answers numbered rather than named, the timed cost you measured yourself, and the signed rule sheet with its objections.

5 - DESIGN - WEEK 5

The build

The signed rule sheet itself: the rule, the reason, how to change it, how to appeal, the right to leave, and the signatures, plus the paired before-and-after compliance chart with instance counts.

7 - BRANDING - WEEK 5

Identity card

A name and a one-line promise for the rule sheet, so the group refers to it by name rather than by whose idea it was, plus the sentence you want repeated afterwards.

9 - DEFENCE - WEEK 6

Defence video

Under three minutes on camera: the rule, the baseline rate and its instance count, who paid and how much, the agreed change, the after rate, and the limits you accept. Nobody identifiable on screen.

2 - OUTREACH - WEEK 3

Expert interview pack

Five written questions for a lawyer, councillor, school administrator, union representative or community organiser, your compliance rate attached as one page, the date and channel of the request, and the reply written word for word.

4 - PROCESS - WEEK 5

Failure log

The sessions that did not happen and why, the instances you could not judge, the day the definition was tightened, anybody who asked you to stop counting, and what each did to the rate, dated.

6 - DESIGN - WEEK 5

One-page explainer

One page read in ninety seconds: the rule, the baseline compliance rate, who pays and how much per week, the agreed change, the two-week result, and what ten sessions cannot tell anybody.

8 - OUTREACH - WEEK 6

Relations ledger

Ten names with dates and replies: one lawyer, councillor, administrator or organiser, three people the breaking costs, three peers who checked your counting method, and three people you sent the chart to who replied.

The four tiers, in this project

Starter

You define one rule as an observable event, count ten identical sessions, ask five affected people what the breaking costs them, produce a compliance chart, and question one stranger who writes rules for a living.

Researcher

You write the definition of an instance and the counting rule before session one, justify ten sessions rather than three, and quantify how many instances you probably missed and which way that biases the rate.

Practitioner

You choose your own observation window and defend the choice, cite any borrowed tally or survey method to its source, and produce one chart a stranger reads correctly without you explaining what an instance is.

Contributor

You set your compliance figure against published work on rule compliance and consent, defend your method to a lawyer or councillor who disagrees, and publish the anonymised tally sheets openly so anybody can recount them.

The one expert you must talk to

Who. A lawyer, a union representative, an elected councillor or union-council member, a school administrator who writes and enforces rules, or a community organiser who has got neighbours to agree to something - anybody whose work is making rules that people actually follow.

Where to find one. District and union-council offices hold public hours; ask at the desk for whoever handles local complaints. Bar associations publish member lists, and most lawyers will answer one short, specific question. A school administrator is usually reachable through the school office in the first hour of the day. Search LinkedIn for 'community organiser' or 'compliance officer' plus your city, and any housing-society or market-committee secretary has spent years enforcing rules with no power to punish.

SEND EXACTLY THIS

Hello, my name is [name]. I counted how often one rule near me is actually followed, and the rate is far lower than anyone expected. I now have to draft a version people will agree to. Could you spare fifteen minutes this week to tell me what makes a rule stick? I will send five questions first.

Ask them

1. When you write a rule, how do you decide who counts as affected and therefore gets a say in it?
2. What makes people follow a rule they did not want, and what makes them ignore one they did?
3. How do you build a way to appeal into a small rule without turning it into a court?
4. What do you do when the people bound by a rule refuse to agree to it?
5. If you had my ten sessions of counts, what would you have measured that I did not?

You will be asked, without warning

1. Would compliance have risen anyway without your change, and how do you know?
2. You counted at one hour of the day in one place. What would a different hour have shown, and why should I believe your rate?
3. Whose consent did you not get, and what does that do to the legitimacy of the rule you wrote?
4. Your new rule carries no punishment. Tell me why it worked, or why it did not, without using the word discipline.

If you get stuck

- If nobody replies to your interview requests - then stop writing and go to your union-council or district office during its public hours and ask whoever is at the desk two questions about a rule they have to enforce.
- If your before and after look the same - then report that as the finding, check whether everybody affected actually knew the new rule existed, and count how many of the signatures belong to people who are ever present during a session.
- If you cannot count the instances - then narrow the definition to a version you can see clearly from one fixed spot, shorten the session, and state the definition and the session length on every chart.
- If you run out of time - then keep both halves at the same number of sessions and cut the cost survey to three answers rather than five, writing on the page what you shortened and why.

Finished early?

Count the same rule in a second place with a different group, using the identical definition and session length, and set the two compliance rates side by side with both instance counts shown.

The Lie This Street Believes

Ask twenty people whether the claim your street forwards every week is true, then count how many say yes.

THE QUESTION

Which false claim is circulating hardest in your own family and neighbourhood groups, how many out of twenty people believe it, and what has believing it already cost them?

Every platform, newsroom, hospital and election office now pays people to decide whether a claim is true and to publish the working behind that decision. Verification is a trade with a method: trace the earliest version, check three sources that did not copy one another, record exactly how each was checked, and measure who believes the claim and what they did about it. Machine-made voices, faces and video are making that method more valuable rather than less, because the cheap part is now producing the lie and the expensive part is proving it.

ACT 1 - FIND

You log every forwarded message, voice note, image and clip reaching your family and neighbourhood groups for seven days, then take the single claim that appears most often and test it against three independent sources, writing down exactly how each check was done. You then ask twenty people the identical, neutrally worded question and record how many say the claim is true, and what believing it has already cost them in money, in treatment avoided, or in somebody blamed.

A one-page costed problem statement carrying four lines: the claim in the words people actually use, the verdict with its three checks and their dates, the percentage of twenty people who say it is true, and what it has cost them. Beside it sits a bar chart of believe, do not believe and not sure, with the refusal count printed underneath.

ACT 2 - FIX

You build a correction of sixty seconds or less - a voice note, a card or a short video - in the same format and the same language the claim travels in, and share it with the same groups and the same twenty people. Seven days later you ask the identical question, in identical words, to the same twenty and compare.

A two-bar chart of the percentage who say the claim is true, before against after, with the change stated both in percentage points and in whole people, the number who saw the correction, the number you could not reach, and a named list of every reason the change might not be yours.

YOU MEASURE

percentage of twenty people who say the claim is true

BEFORE

The same neutrally worded question, read word for word from the page, put to each of twenty people separately before any correction exists, with each answer recorded as true, false or not sure against a code number, and every refusal counted in its own column.

AFTER

The identical wording, read from the same page, put to the same twenty coded people seven days after the correction was shared, with anyone who cannot be reached recorded as unreachable rather than assumed unchanged.

Safety and ethics - not optional

- Never name the person who sent a message, and never screenshot a private chat with a name, a number or a profile picture visible. Type the claim out in your own words and give every group a code letter instead of its name.
- Never test a claim about religion, politics, a sect, an ethnic group or a named person. Choose a practical, local claim instead: a remedy, a price rumour, a scam, a claim about a school, a water supply or an electricity bill.
- Never accuse anybody of lying. The message is wrong; the person who forwarded it is not attacked, not named and not corrected in public. Never publish anyone's belief with their name attached - beliefs live against code numbers only.
- The correction is polite, sourced and short. If a group turns hostile, stop posting there at once, do not argue back, leave, and write down what was said and what you did. That write-up is a finding and it is marked as one.

WHAT YOU USE - HIGH-TECH ROUTE

Google Sheets - the seven-day tally of forwards, the twenty coded belief answers, and the before-and-after arithmetic in visible formula cells

Google Images reverse image search (images.google.com, the camera icon) - trace a photograph or a video frame back to the earliest place it appears online

Google Fact Check Explorer (toolbox.google.com/factcheck/explorer) - search published verdicts on the claim by keyword, in each language it circulates in

AFP Fact Check (factcheck.afp.com) - a second, free, searchable archive of checked claims, used to test whether your sources are genuinely independent

Canva, free plan - the correction card or the sixty-second video, with the source printed on the final frame

Google Docs - the check table, the evidence log, the one-page explainer and the expert interview pack

Everything runs in a browser and a phone: a free spreadsheet holds the tally of forwards and beliefs, reverse image search and published fact-check archives do the checking, and a free design tool makes the sixty seconds.

Act 1 – find the problem steps 1 to 5, ending with a costed problem statement

1 Collect the forwards 45 MINUTES SPREAD OVER SEVEN DAYS

Log every forwarded message, voice note, image and clip that reaches your family and neighbourhood groups for seven days.

- Open a Google Sheets file named 'The Lie This Street Believes' with columns: date, group code, format, the claim in one sentence, times seen.
- Give every group a code letter and every sender nothing at all, so no name, number or profile picture ever enters the file.
- Type each claim out in your own words in one sentence rather than screenshotting it, and record the format - text, voice note, image, video, link - because the format decides how you check it.
- When the same claim arrives again, add one to the times-seen count instead of opening a new row.
- Where you must keep an image to check later, save it to a dated Drive folder cropped so the sender's name, number and picture are outside the frame.

WRITE THIS DOWN

One row per distinct claim, with dates, format, group code and a running times-seen count for the full seven days.

DONE WHEN

Seven days are logged, every group appears as a letter, and no name, telephone number or profile picture exists anywhere in the file.

Watch out. Screenshotting a chat with names and numbers showing. Type the claim yourself; a screenshot that identifies the sender cannot be used, cannot be shown, and cannot be defended.

2

Pick one claim 40 MINUTES

Choose the single claim that appeared most often and write it as one sentence that can be shown true or false.

- Sort the sheet by times seen, largest first, and read the top five aloud.
- Strike out anything about religion, politics, a sect, an ethnic group or a named person, and write 'out of bounds' beside each one.
- From what is left, take the most practical and local: a remedy, a price, a scam, a claim about a school, a water supply or an electricity bill.
- Rewrite it with no hedging, in the words people actually use, so that evidence can settle it - for example 'boiling this cures that', or 'the bill rises if you do this'.
- Write one line on what somebody would do, spend or avoid if they believed it, because that is what you will cost later.

WRITE THIS DOWN

The chosen claim as one testable sentence, the four claims you rejected, and the reason each was rejected.

DONE WHEN

Somebody reading your sentence can tell you what evidence would prove it wrong.

Watch out. Choosing the claim that annoys you most rather than the one that spreads most. The count decides, not your temper.

3

Check it three ways 90 MINUTES

Test the claim against three sources that did not copy one another, and record exactly how each check was done.

- Search Google Fact Check Explorer for the claim in the words people use, then again in the other language it circulates in, and record every verdict with its publisher and date.
- Search AFP Fact Check for the same claim, then follow each result back to the material it cites - if two of your sources meet at the same original post, they count as one.
- For a photograph or a video frame, run it through Google Images reverse image search, sort by oldest, and write down the earliest date and place the picture appears.
- Go to one source with direct authority: a pharmacist or a doctor for a remedy, the utility's own published tariff for a bill claim, the school office for a school claim, and write down what they said and on what date.
- Fill a check table in Google Docs with four columns: source, what it says, how you checked it, date checked.

WRITE THIS DOWN

The three checks in full, each with a link or a named person, the method used, the date, and the verdict the claim ends with: true, false or unproven.

DONE WHEN

Three independent checks exist and a stranger could repeat any one of them from your notes alone.

Watch out. Counting three websites that all quote the same original post as three sources. Follow each back to where it started; if they meet, you have one source and two echoes.

4

Ask the twenty 90 MINUTES OVER THREE DAYS**Put the same neutrally worded question to twenty people and record what each of them believes.**

- Write the question once and never change a word: 'Have you heard that [claim]? Do you think that is true, false, or are you not sure?'
- Practise saying it flat, with no tone and no expression, on two people first, and leave those two out of the count.
- Ask each of the twenty on their own, so nobody hears anybody else's answer before giving their own.
- Record every answer in Sheets as true, false or not sure against a code number, never a name, and count anybody who declines in a separate refusal column.
- Ask one follow-up only - 'where did you first hear it' - and write the reply in their own words.

WRITE THIS DOWN

Twenty coded rows, one answer each, the refusal count, and the place each person said they first heard the claim.

DONE WHEN

Twenty answers exist, all given to identical wording, and no name sits beside any belief anywhere in the file.

Watch out. Adding 'but that is not true, is it' to the end of the question. That sentence collects your own answer twenty times over.

5

Count the cost 60 MINUTES**Find out what believing this claim has already cost the people who believe it.**

- Go back to those who answered 'true' and ask what they did about it: bought something, avoided something, stopped taking a medicine, changed shop, warned a relative.
- Put a rupee figure on anything bought or avoided, taken from a price you check yourself at the shop or the pharmacy counter, not from memory.
- Record any harm that is not money in one line each and with no names: a treatment delayed, a shop or a person blamed, an argument in the family.
- Multiply the average cost by the number who answered true to get a cost across the twenty, and label it plainly as an estimate from a small sample.
- Where a believer says the claim cost them nothing, record that as a zero rather than leaving the cell empty.

WRITE THIS DOWN

What each believer did, the rupee cost where there is one, the harm that is not money where there is not, and the estimated cost across the twenty.

DONE WHEN

You can state one sentence of the form 'this many of twenty believe it, and between them it has cost this much'.

Watch out. Rounding one dramatic case up into a street-wide figure. Report the cases you actually collected and say how many there were.

6

Name the cost 50 MINUTES

Finish the costed problem statement on one page and choose exactly what your sixty-second correction will be.

- Write four lines: the claim in its own words, the verdict with its three checks, the percentage of twenty who say it is true, and what it has cost so far.
- Build one chart in Sheets of believe, do not believe and not sure, titled with the finding rather than with the word chart, and print the refusal count underneath it.
- Choose the format the same people actually use: a voice note if the claim arrived as a voice note, a card if it arrived as an image, a short video if it arrived as a clip.
- Write the prediction as one sentence: 'I will share a sixty-second correction with the same twenty people and expect belief to fall from A per cent to B per cent in seven days.'
- Show the page to one person who believed the claim, ask what would make them stop forwarding it, and write their answer down word for word.

WRITE THIS DOWN

The one-page costed problem statement, the chart, the chosen format with the reason it was chosen, and the dated prediction.

DONE WHEN

Somebody who was not there reads the page once and repeats your percentage back correctly.

Watch out. Choosing the format you enjoy making rather than the one that reaches these people. If the claim travels by voice note, a printed poster will never catch it.

7

Make the sixty seconds 90 MINUTES

Build a correction of sixty seconds or less that is polite, sourced, short and easy to forward.

- Script it in this order: what the message says, what is actually true, the one source that shows it, and what to do instead. Read it aloud against a watch and cut until it fits sixty seconds.
- Correct the message and never the sender: write 'this message is wrong' and never 'whoever sent this is lying'. Name nobody.
- Build the card or the sixty-second video in Canva on the free plan, in the language the claim circulates in, with the source printed on the final frame.
- Show the draft to two people first - one who believed the claim and one who did not - and write down every word each of them changed.
- Check it reads and plays on a small phone screen with the sound off before it goes anywhere.

WRITE THIS DOWN

The script, both reviewers' comments word for word, and the final file with its source line visible on screen.

DONE WHEN

It runs in sixty seconds or under, shows one named source, and names no person at all.

Watch out. Repeating the false claim loudly at the start so that it is the part people remember. Say it once, plainly, then spend the rest of the time on what is true.

8

Share it 45 MINUTES

Send the correction into the same groups the claim came from and log exactly where it went.

- Post it in each group it belongs in with one polite sentence of your own and no accusation in it.
- Send it directly to each of the twenty people you asked, one at a time, so that the sharing and the count cover the same people.
- Log the date, the group code, roughly how many people that group holds, and anything said back, in a fresh tab of the sheet.
- Ask three people to forward it on, and record whether they actually did.
- If any group turns hostile, stop posting there immediately, leave the argument alone, and write down what was said and what you did about it.

WRITE THIS DOWN

The share log with dates, group codes and replies, plus any hostility recorded in full alongside your own response to it.

DONE WHEN

All twenty have received it, every group is logged, and any hostile response is written up rather than argued with.

Watch out. Replying to every angry message. One polite reply carrying the source, then stop. An argument in a group is a finding to record, not a fight to win.

9

Ask the same twenty again 75 MINUTES

Seven days later, put the identical question to the same twenty people and compare.

- Wait a full seven days from the day you shared it, and record the exact date of each re-asking.
- Read the question from the same page, word for word, exactly as it was asked the first time.
- Ask 'did you see the correction' only after they have answered, never before it.
- Match every answer to its code number, and record anybody you cannot reach as unreachable rather than assuming they did not change.
- Chart before against after in Sheets as two bars for the percentage saying true, and state the change in percentage points and in whole people.

WRITE THIS DOWN

The twenty after-answers against their codes, the unreachable count, both percentages, and the change stated in people as well as per cent.

DONE WHEN

Before and after exist for the same coded people, asked in identical words, and you can say how many people actually moved.

Watch out. Counting anybody you could not reach as convinced. Report them separately and say what your percentage becomes either way.

10

Share and reflect 60 MINUTES

Publish the finding, defend it to real people, and record honestly what the correction did and did not do.

- Record a defence video of no more than three minutes: the claim, the three checks, the before percentage, the correction, the after percentage and the limits.
- Show the one-page explainer to three people the claim affected and write down what each of them said.
- Send the before-and-after chart to the expert you interviewed with one question: what would you have checked that I did not.
- State plainly whether the correction moved anybody, including if it moved nobody, and name every reason it might not have.
- Complete the relations ledger with ten entries - names for the expert, the peers and the people you shared with, code numbers for anybody whose belief you recorded.

WRITE THIS DOWN

The defence video, the one-page explainer, and the relations ledger holding ten logged relationships with dates and replies.

DONE WHEN

Ten relationships are logged with dates and replies, and the after-percentage is published whether it fell, held or rose.

Watch out. Hiding a correction nobody watched. A correction that reached four people and moved none is a result, and it is worth more than a number you cannot show.

Your nine deliverables in this project

1 - RESEARCH - WEEK 2

Question card

One card naming the claim in the words people use, the groups it circulates in as code letters, and the question: how many of twenty believe it, and what has it cost them.

3 - RESEARCH - WEEK 4

Evidence log

The seven-day tally of forwards, the check table with source, method and date for all three checks, and twenty coded belief answers before and after. No name sits beside any belief.

5 - DESIGN - WEEK 5

The build

The sixty-second correction itself - voice note, card or short video with its source on the final frame - together with the two-bar chart of belief before and after.

7 - BRANDING - WEEK 5

Identity card

A name and a one-line promise for the correction, so people can ask for it by name, plus the single sentence you want repeated when somebody forwards the claim again.

9 - DEFENCE - WEEK 6

Defence video

Under three minutes on camera: the claim, the three checks and their dates, the before percentage, the correction, the after percentage, and the limits you accept without argument.

2 - OUTREACH - WEEK 3

Expert interview pack

Five written questions for a journalist, fact-checker or pharmacist, your three checks attached as one page, the date and channel of the request, and the reply recorded word for word.

4 - PROCESS - WEEK 5

Failure log

The check that led nowhere, the two sources that turned out to be one, the people you could not reach again, the group that turned hostile and what you did, all dated.

6 - DESIGN - WEEK 5

One-page explainer

One page a neighbour reads in ninety seconds: the claim, how it was checked three ways, the percentage who believed it, what it cost, the correction, and the after number.

8 - OUTREACH - WEEK 6

Relations ledger

Ten entries with dates and replies: one journalist or pharmacist, three people the claim affected, three peers who checked your checking, three people you sent the correction to who answered.

The four tiers, in this project

Starter

You log seven days of forwards, check the most repeated claim against three sources, ask twenty people the same fixed words, and put your questions to one journalist, fact-checker or pharmacist.

Researcher

You fix the question wording and the checking method in writing before collecting anything, justify twenty rather than five, and quantify what refusals and unreachable people do to your percentage.

Practitioner

You choose the twenty yourself and defend who they are, cite every check to its page and its date, and make one chart a stranger reads correctly without you standing beside it.

Contributor

You set your finding against published fact-checks of the same claim, defend your checking method to a working fact-checker who disagrees, and publish your coded data and every check openly.

The one expert you must talk to

Who. A journalist or a fact-checker who publishes verification work. If your claim is a remedy, a pharmacist or a doctor is the right person to ask. If it is a claim about how something works, a science teacher will take it apart with you.

Where to find one. Newspapers print a newsroom desk telephone number and an email on the masthead, and press clubs list working reporters. A pharmacy counter is open all day and the pharmacist has already heard your claim from somebody. A hospital's public-relations office will pass a request to a doctor. Search LinkedIn for 'fact-check' or 'verification' plus your city.

SEND EXACTLY THIS

Hello, my name is [name]. One claim is being forwarded around my family and neighbourhood groups every week. I checked it against three sources and then asked twenty people whether they believe it. Most said yes. Could you spare fifteen minutes this week to tell me what my checking missed? I will send five questions first.

Ask them

1. When a claim reaches you, what is the first check you run, and why that one before any other?
2. How do you decide that two sources are genuinely independent rather than quoting the same original post?
3. What do you do with a claim you cannot prove either way, and how do you publish that without helping it spread?
4. Which corrections have you seen actually change what people forward, and what did those have in common?
5. When a group turns hostile at being corrected, what do you do next, and what have you learnt not to do?

You will be asked, without warning

1. Would the belief have dropped anyway without your correction, and how do you know?
2. You called your three sources independent. Show me they do not all trace back to one original post.
3. Twenty people, and you chose them. Who did you leave out, and which way would including them push your percentage?
4. The same claim comes back next month in slightly different words. What did your sixty seconds actually achieve, in numbers?

If you get stuck

- If nobody will answer your question - then stand at a shop counter at a busy hour, ask the shopkeeper and the next four customers, and record every refusal as a refusal.
- If your before and after look the same - then report that as the finding, check first how many of the twenty actually saw the correction, and write that number beside the result.
- If you cannot check the claim properly - then record it as unproven rather than false, say plainly which check you could not complete, and correct only the part you can prove.
- If you run out of time - then re-ask ten of the twenty rather than dropping the baseline, and state the smaller after-sample on the chart itself.

Finished early?

Run the identical question on twenty people in a second neighbourhood that never saw your correction, and set the two after-percentages side by side.

The Trigger

Log one small habit of your own for fourteen days and find the cue you never knew was there.

THE QUESTION

How many times a day does one small habit of yours actually happen, and which single cue is present in most of those times?

Almost nobody can say how often they do the ordinary things they do, which is why behaviour is counted rather than remembered by anyone who works with it seriously. Behavioural researchers, product designers, safety engineers and policy teams all earn their living from the same two moves you make here: define one observable event, then log what reliably comes immediately before it. The value is not in the habit you pick; it is in the discipline of writing down an event within a minute of it happening for four straight weeks, and then reporting a comparison that may well go against you.

ACT 1 - FIND

You pick one small, harmless, everyday habit of your own and count it for fourteen consecutive days, writing down the time, the place, whether anyone else was present, and what happened in the minute immediately before. You then time a sample of occurrences with a stopwatch so the count can be turned into minutes.

A one-page costed problem statement carrying four lines: the habit defined as an observable event, occurrences per day averaged over fourteen days, minutes per day and hours per year that count represents, and the single cue present in the largest share of occurrences with that share written as a percentage. Beside it sits a bar chart of occurrences by cue, largest bar first, and a line of the daily count across all fourteen days.

ACT 2 - FIX

You remove or change exactly one thing - the single cue that showed up in most occurrences - and you leave the habit itself alone rather than trying to stop it by willpower. You then log fourteen more consecutive days with the identical definition, the identical log and the identical recording rule, so the only moving part is the cue.

A twenty-eight-day line of the daily count with the change day marked, the two fortnight means set side by side, the difference in occurrences per day and in minutes per week, a named list of confounders, and one honest paragraph on whether the cue moved the habit, moved it somewhere else, or did nothing.

YOU MEASURE

occurrences per day of one defined habit of your own

BEFORE

Fourteen consecutive days of logging every occurrence of one habit of your own, entered within a minute of it happening, each row carrying time, place, whether you were alone or with one other or with two or more people, and what happened in the minute before. Reported as a mean across the fourteen days with every daily count shown. Taken before any cue is touched.

AFTER

Fourteen more consecutive days logged with the same definition, the same log, the same within-a-minute rule and the same fourteen-day length, beginning the day after the cue is changed, reported as a mean with every daily count shown beside the first fortnight.

Safety and ethics - not optional

- You log your own habit and nobody else's. Not a family member's, not a friend's, not a classmate's, not even with their permission and not even if they offer. Anyone who happens to be present is recorded only as alone, one other person, or two or more people, and never by name, relationship or description.
- Choose something small and harmless: checking your phone, snoozing the alarm, opening a new browser tab, checking the front door is locked, picking up the remote, saying one filler word. This project does not touch food, eating, weight, appearance, sleep restriction, medication, self-harm, or any behaviour you feel bad or worried about. If a candidate habit is on that list, or you are not sure, pick a different one.
- If the logging itself starts to feel bad - if counting makes you tense, self-critical or unwilling to open the log - stop that day, pick a different habit, and write in the write-up what you stopped and why. That is a recorded finding and it is marked as one, not as a failure.
- No diagnosis language anywhere in this project. You are measuring the frequency of one event and one cue, nothing more. Do not describe yourself or anyone else as having a condition, do not use the word addiction, and do not offer advice to anybody about their own behaviour on the strength of twenty-eight days of your own data.

WHAT YOU USE - HIGH-TECH ROUTE

Google Forms - a four-question form saved to the phone home screen, so one occurrence takes about eight seconds to record and the submission time is stamped automatically rather than remembered

Google Sheets, or LibreOffice Calc where there is no account - the linked response sheet holding one row per occurrence, plus the daily counts and the fortnight means in visible formula cells

The pivot table and COUNTIF in your spreadsheet - counting occurrences by cue, by place, by hour of day and by whether anyone else was present

The chart editor built into your spreadsheet - the twenty-eight-day daily count line with the change day marked, and the occurrences-by-cue bar chart

The stopwatch already on your phone - timing a sample of occurrences so the count can be converted into minutes per day and hours per year

Google Docs, or any plain text editor - the definition, the protocol, the evidence log, the failure log and the one-page explainer

A free form on your phone home screen timestamps every occurrence the moment you tap it, the answers land in a free spreadsheet, and the spreadsheet counts and charts them without a second tool or a second login.

Act 1 - find the problem steps 1 to 5, ending with a costed problem statement

1 Choose the habit 40 MINUTES

Pick one small, harmless, everyday habit of your own and check it against the exclusion list before anything else.

- Write down five ordinary things you do without deciding to: checking the phone, snoozing the alarm, opening a new tab, checking the lock, picking up the remote, saying one filler word.
- Strike out anything touching food, eating, weight, appearance, sleep restriction, medication, self-harm, or anything you feel bad or worried about, and strike out anything that is somebody else's habit.
- From what survives, choose the one that happens often enough to count and matters little enough to log calmly, and write one sentence on why you chose it.
- Write the safety line at the top of your working document: I log only my own habit, I name nobody, and if the logging feels bad I stop and change habit.
- Guess, in writing and dated, how many times a day it happens, so your guess is on record before the data exists.

WRITE THIS DOWN

The five candidates, the ones struck out and why, the habit chosen, and your dated guess at the daily count.

DONE WHEN

One habit is named, it survives the exclusion list in writing, and your guess is recorded before day one.

Watch out. Picking the habit you most want to be rid of. That one is loaded, it makes the logging feel like judgement, and judgement makes people log less. Pick a small dull one; the method is the point.

2

Define one occurrence 45 MINUTES

Turn the habit into an event so clearly defined that two people watching would count the same number.

- Write the definition as one sentence a stranger could apply: for example, one occurrence begins when the screen lights in my hand and ends when it goes dark, and a second unlock within thirty seconds counts as the same occurrence.
- Write the boundary rules that stop double counting: the minimum gap between two occurrences, and what happens if the habit is interrupted halfway.
- Build a Google Form with four questions: where I am, who is present as alone or one other or two or more, what happened in the minute before as a short free-text line, and how the occurrence ended.
- Save the form to your phone home screen as an icon and open it once to time yourself filling it in.
- Test the definition for one hour on an ordinary afternoon, count out loud, and rewrite any rule that turned out to be ambiguous.

WRITE THIS DOWN

The one-sentence definition, the boundary rules, the four form questions, and the corrections the one-hour test forced.

DONE WHEN

You can read the definition to somebody else and they can tell you, without asking a question, whether a described event counts.

Watch out. Defining the habit as a feeling rather than an event. An urge cannot be counted by anyone but you and cannot be checked by anybody. Define something a camera in the room would see.

3

Log week one 10 MINUTES A DAY FOR SEVEN DAYS

Record every occurrence for seven consecutive days, within a minute of it happening.

- Tap the form the moment the occurrence ends, before you do anything else, and never at the end of the day from memory.
- In the free-text box, write what physically happened in the minute before in five words or fewer: phone buzzed, walked into kitchen, finished a task, sat down, conversation stopped.
- Each night open the response sheet, count the day's rows, and type one line saying how complete the day was and roughly what you missed.
- On any day you know you missed a run of occurrences, mark that whole day as partial rather than repairing it from memory.
- Do not try to change the habit this week; if you notice yourself doing it less because of the logging, write that down as its own line.

WRITE THIS DOWN

One row per occurrence, seven nightly completeness lines, and any day marked partial with the reason.

DONE WHEN

Seven consecutive days have a count, including any zeros, and the completeness lines exist including the ones admitting you missed some.

Watch out. Filling in the day on the bus home. Recall flattens counts badly and destroys the before-column entirely, because nobody remembers what happened in the minute before something they were not paying attention to.

4

Log week two 10 MINUTES A DAY FOR SEVEN DAYS PLUS 30 MINUTES**Log seven more days the same way and time a sample of occurrences so the count can be turned into minutes.**

- Keep logging identically; do not add or remove a form question mid-fortnight, and if you must, log the change with its date and time.
- On three of the seven days, start the phone stopwatch at the beginning of ten occurrences and record the seconds each one lasted.
- Take the mean of those timed occurrences and write it as seconds per occurrence, with the number of occurrences it was based on beside it.
- Compare the count on the two weekends with the count on the ten weekdays and note the difference in one line.
- Check the sheet has fourteen dated days with no gaps, and mark any missing day as missing rather than deleting it.

WRITE THIS DOWN

Fourteen complete days of rows, the timed sample with its mean seconds per occurrence and its sample size, and the weekend against weekday line.

DONE WHEN

Fourteen consecutive daily counts exist and you have a measured seconds-per-occurrence figure with the sample size written beside it.

Watch out. Timing only the long occurrences because they are easier to catch. Time the next ten that happen, whatever their length, and say plainly in the log that the sample was ten consecutive events rather than ten chosen ones.

5

Find the cue 50 MINUTES**Count what came immediately before, and find the single cue present in most occurrences.**

- Read every entry in the before-column and sort them into no more than six named categories, writing the rule you used to sort them.
- Build a pivot table counting occurrences per category, and write each category's share of the total as a percentage.
- Do the same for place, for hour of day, and for whether you were alone or with others, so you know which of the four columns actually separates the data.
- Draw the occurrences-by-cue bar chart in the spreadsheet chart editor, largest bar first, titled with the finding.
- Draw the fourteen-day daily count as a line, and write one sentence on whether the count drifted downwards simply because you were logging it.

WRITE THIS DOWN

The category rule, the counts and percentages per cue, place, hour and company, the cue bar chart, and the fourteen-day line.

DONE WHEN

You can name one cue and state the percentage of occurrences it was present in, and open the rows behind that percentage.

Watch out. Naming a cue that is present in most occurrences and also present all day long. Being at home is not a cue if you are always at home. Ask whether the cue is also there during the hours the habit does not happen.

6

Name the cost 50 MINUTES

Finish the costed problem statement on one page and choose the one cue you will remove or change.

- Write four lines: the habit as defined, occurrences per day averaged over fourteen days, minutes per day and hours per year from your timed sample, and the top cue with its percentage.
- Put the cue bar chart and the fourteen-day line on the same page, with the sample size for the timing printed under them.
- List three ways the top cue could be removed or changed physically rather than by willpower: move an object, silence a notification, change a route, change what sits on a surface, change the order of two things.
- Choose one and write the sentence: 'For fourteen days I will change X and expect the daily count to fall from A to B.'
- Compare that prediction with the guess you dated in step one, and write one line on how wrong the guess was.

WRITE THIS DOWN

The one-page costed problem statement, the three candidate cue changes, the chosen change as one testable sentence, and the guess-against-measurement line.

DONE WHEN

Somebody who was not there reads the page once and repeats your occurrences-per-day figure and your top cue back correctly.

Watch out. Choosing to try harder instead of changing a cue. Trying harder is not a change anybody can film, cannot be repeated by a reader, and gives you nothing to report when the count moves.

7

Set the protocol 40 MINUTES

Write down what must stay identical across the second fortnight so the two halves can be compared at all.

- Write what is fixed: same definition, same boundary rules, same four form questions, same within-a-minute recording rule, same fourteen-day length.
- Write what is allowed to move: only the one cue named in step six.
- Make the cue change physically today and photograph the before and after of whatever you moved, silenced or rearranged.
- Add fourteen blank dated rows to the sheet before any data exists, and mark the change day on the chart axis now.
- Type your prediction into the sheet with today's date and time, and leave it visible for the whole fortnight.

WRITE THIS DOWN

The protocol as a numbered list, the fourteen dates, the two photographs of the cue change, and the timestamped prediction.

DONE WHEN

The cue is physically changed, the photographs exist, and a prediction sits in the sheet that plainly predates the second fortnight.

Watch out. Changing the cue and the definition at the same time, usually by tightening the definition because week two felt sloppy. Tighten nothing now. Anything you must change goes in the failure log with the date and hour.

8

Log fortnight two 10 MINUTES A DAY FOR SEVEN DAYS**Log the first seven days after the cue change exactly as you logged the baseline.**

- Tap the same form within a minute of every occurrence, with the same four questions and the same categories.
- Keep writing the before-column even though you think you know the answer, because the interesting result is a new cue replacing the old one.
- Each night write one line on whether the cue change held, was partly held, or was undone, and why.
- If you undid the change on any day, log that day normally and mark it as cue restored rather than dropping it.
- Stop and write it down if the logging starts to feel bad; changing habit at this point is a recorded finding, not a failed project.

WRITE THIS DOWN

Seven complete days of rows, seven nightly lines on whether the cue change held, and any cue-restored day marked.

DONE WHEN

Seven days carry counts with the same columns as the baseline, and the failure log holds at least one honest entry.

Watch out. Not logging on the days the count is high because it feels like the project is going wrong. A high day with its before-column intact is worth more than a whole clean week without one.

9

Compare the fortnights 60 MINUTES**Log the last seven days, then set twenty-eight days side by side and report the difference honestly.**

- Finish days eight to fourteen, then calculate the mean occurrences per day for each fortnight in a formula cell.
- Chart all twenty-eight daily counts as one line with a vertical mark on the change day, so a reader sees the shape rather than only two numbers.
- Rebuild the cue bar chart for the second fortnight and set it beside the first, to show whether the old cue vanished and something else took its place.
- List every confounder by name: exam weeks, travel, illness, a holiday, a new phone, weather, a changed timetable, and the plain fact that you were watching yourself.
- State the change as occurrences per day, as a percentage and as minutes per week, and write one sentence on whether fourteen days either side is enough to be sure.

WRITE THIS DOWN

The twenty-eight-day line with the change day marked, both fortnight means, both cue charts, the difference in occurrences and minutes, and the confounder list.

DONE WHEN

You can state the before mean, the after mean, and at least two reasons the difference might not be your doing.

Watch out. Claiming the cue change worked when the count was already falling through the first fortnight. Look at the shape of the twenty-eight-day line before you claim anything; a trend that started before the change is not your change.

10

Share and reflect 60 MINUTES**Publish the finding, defend it to real people, and record what you will keep.**

- Record a defence video of no more than three minutes: the definition, the count, the cue, the change, the twenty-eight-day line, the result and the limits, naming nobody.
- Show the one-page explainer to three people and write down what each of them said, including anyone who did not believe the count.
- Send the twenty-eight-day chart to the expert you interviewed with one question: what would you have recorded that I did not.
- Write one paragraph on whether you are keeping the cue change, and why, without turning it into advice for anybody else.
- Complete the relations ledger with ten names, roles, dates and what each person replied.

WRITE THIS DOWN

The defence video, the one-page explainer, the keep-or-drop paragraph, and the relations ledger holding ten logged relationships.

DONE WHEN

Ten relationships are logged with dates and replies, no other person's behaviour appears anywhere in what you published, and no diagnosis language appears in any of it.

Watch out. Ending on a lesson about willpower. You measured one event, one cue and one physical change across twenty-eight days. Report those, report the limits, and stop there.

Your nine deliverables in this project**1 - RESEARCH - WEEK 2****Question card**

One card carrying the habit written as an observable event with its boundary rules, the twenty-eight dates, your dated guess at the daily count, and the question: how often, and after what.

2 - OUTREACH - WEEK 3**Expert interview pack**

Five written questions for a psychologist, counsellor, teacher or behavioural researcher, your fourteen-day count and cue chart attached as one page, the date and channel of the request, and the reply recorded word for word.

3 - RESEARCH - WEEK 4**Evidence log**

Every occurrence row with time, place, company as alone, one other, or two or more, and what happened in the minute before, plus the timed sample with its size and the nightly completeness lines.

4 - PROCESS - WEEK 5**Failure log**

The days logged from memory, the days marked partial, the hour any rule was changed, the days the cue change was undone, and any point the logging felt bad and you stopped, all dated.

5 - DESIGN - WEEK 5**The build**

The logging system itself - the pocket card or the four-question form - together with the twenty-eight-day daily count line with the change day marked, and the two occurrences-by-cue bar charts side by side.

6 - DESIGN - WEEK 5**One-page explainer**

One page a stranger reads in ninety seconds: the habit, occurrences per day, hours per year, the cue and its percentage, the one physical change, the second fortnight, and what twenty-eight days cannot tell anybody.

7 - BRANDING - WEEK 5**Identity card**

A name and a one-line promise for the measurement so it can be referred to by name, plus the single sentence you want repeated: the count, the cue, and no claim about anybody's character.

8 - OUTREACH - WEEK 6**Relations ledger**

Ten names with dates and replies: one psychologist, counsellor, teacher or behavioural researcher, three people the habit affects, three peers who checked your counting rule, and three people who replied to the chart you sent.

9 - DEFENCE - WEEK 6**Defence video**

Under three minutes on camera naming nobody: the definition, the count, the cue with its percentage, the physical change, the twenty-eight-day line, the result, and the limits you accept without argument.

The four tiers, in this project

Starter

You define one habit as an observable event, log fourteen days without a gap, name the cue present in most occurrences, produce a daily count chart, and question one stranger who studies behaviour.

Practitioner

You defend why your definition counts one event and not two, cite any borrowed logging method to its source, and produce one chart a stranger reads correctly without you explaining what a cue is.

Researcher

You write the definition and the recording rule before day one, justify fourteen days rather than seven, and quantify how much of the count you probably missed and which way that biases the cue ranking.

Contributor

You set your cue finding against published work on antecedents and habit interruption, defend your method to a behavioural researcher who disagrees, and publish the anonymised twenty-eight-day log openly so anybody can recount it.

The one expert you must talk to

Who. A psychologist, a school or workplace counsellor, a teacher who runs a classroom routine deliberately, or a behavioural researcher at a university or in a product or safety team - anybody whose job involves counting what people do rather than asking them what they do.

Where to find one. University psychology and behavioural science departments publish staff pages with email addresses and research interests; pick one whose interests mention habits, routines or self-monitoring. Search LinkedIn for 'behavioural researcher' or 'behavioural scientist' plus your city. A school counsellor is usually reachable through the school office in the first hour of the day, and a teacher who runs a tight classroom routine is an expert on cues whether or not they use the word.

SEND EXACTLY THIS

Hello, my name is [name]. I logged one small habit of my own for fourteen days and I now have a cue that shows up in most of them. I am not sure my cue is real rather than just always present. Could you spare fifteen minutes this week to tell me? I will send five questions first.

Ask them

1. When you count a behaviour, how do you decide where one occurrence ends and the next begins?
2. How much does the act of logging change the thing being logged, and how do people usually detect that?
3. How would you tell a real cue apart from something that is simply present all day?
4. When one cue is removed, what usually happens next, and how would that show up in a fourteen-day count?
5. If you had my twenty-eight days of data, what one column would you have asked me to record that I did not?

You will be asked, without warning

1. Would the count have fallen anyway without your cue change, and how do you know?
2. You were watching yourself for twenty-eight days. Show me where in your data you can separate the effect of the cue change from the effect of being watched.
3. Your top cue was present in most occurrences. How many hours a day was that cue present when the habit did not happen, and what does that do to your claim?
4. Somebody applies your definition to a day of your life and gets a different number from yours. Where would the disagreement come from, and which of you would be right?

If you get stuck

- If nobody replies to your interview requests - then stop writing and walk into the nearest school office at the start of the day and ask any teacher who runs a strict classroom routine how they get a whole room to do the same thing at the same signal.
- If your two fortnights look the same - then report that as the finding, check the nightly lines to see whether the cue change actually held on all fourteen days, and look at the second cue chart for something that took the old cue's place.
- If you could not catch the occurrences in time - then narrow the definition to a version you can catch, log a fixed four-hour window each day instead of the whole day, and state the window on every chart.
- If you run out of time - then keep both halves at fourteen days and drop the timing sample rather than the log, reporting the count without the minutes and saying on the page why the minutes are missing.

Finished early?

Log a second habit of your own alongside the first for the same twenty-eight days, without changing anything about it, so you have an untouched comparison line against your changed one.

The Cheapest Clean

Five methods already in your cupboard, one stain, one score each, and the rupees every use quietly costs.

THE QUESTION

Which of five cleaning methods already in your house shifts the same stain best, and what does each one cost per use?

Every claim printed on a cleaning label started as a controlled comparison somebody ran on a bench, and the industry that runs them - formulation, quality control, consumer testing - pays for people who can hold conditions still. A result means nothing without its controls, which is why the same cloth, the same dose, the same water and the same contact time matter more than the product does. Cost per use is how procurement teams in hospitals, hotels and factories actually choose between products, and almost nobody at home ever works it out.

ACT 1 - FIND

You take one stain that keeps returning in this house, make five identical patches on one cloth, and test five methods already in the cupboard under conditions you hold still and write down first. You then measure how much of each product a single test consumed and divide the pack price by the pack quantity, so every method carries a rupees-per-use figure beside its score.

A one-page costed problem statement: the stain, how often it happens, the five methods ranked by removal score out of five, the rupees per use printed beside each score, and the household's yearly spend on its current method at the real stain frequency. Beside it sit the five patches or their photographs in a row, the written scoring scale, and the dose behind every cost figure.

ACT 2 - FIX

The household switches to the winning method for one month, and every stain event is logged exactly as it was logged during the baseline fortnight: item, product, quantity used, rupees, minutes of scrubbing and the score afterwards. Both periods are then divided down to the same length so they can be set against each other.

Two comparisons on the same page - rupees per week and minutes per week, baseline fortnight against switched month - with the mean score achieved, the named confounders, and the household's recorded answer on whether the switch stays.

YOU MEASURE

rupees per use to shift one standard stain, and the removal score those rupees buy

BEFORE

Five identical patches from one cloth, the same stain quantity, the same stain age, the same water volume and temperature, the same contact time and the same scrub count, scored on a written five-point scale by three people who cannot see which method is which. Quantity used is weighed or counted per test and multiplied by the pack price divided by the pack quantity. Alongside it, a fourteen-day log of what the household spends and scrubs now.

AFTER

The same log kept for one month on the winning method - item, product, quantity, rupees, minutes and score for every stain event - with both periods divided by their number of weeks, so a fortnight and a month are compared as rupees per week and minutes per week.

Safety and ethics - not optional

- Never mix cleaning products with each other. Bleach with an acid - vinegar, lemon, lime, a descaler or a toilet cleaner - or bleach with ammonia releases a gas that damages lungs. This rule is absolute: one product per bowl, each bowl rinsed and emptied before the next, and no leftovers poured together.
- Work where air moves - an open window, an open door, or at an outdoor tap - with gloves on and an adult in the room for every test. Nothing is heated, boiled or put near a flame; every test uses water straight from the tap.
- Nothing is tasted, nothing is deliberately smelled, nothing is inhaled to identify it. Keep every product in its own labelled container, never decant into a drinks bottle, and rinse skin or eyes under running water immediately on contact.
- Any product carrying a hazard symbol is used exactly as its label instructs, or it is left out of the test. If the label is missing, or you cannot read what is inside, it does not go near a patch.

WHAT YOU USE - HIGH-TECH ROUTE

Google Sheets - the method table, the stain log, and the pack price divided by pack quantity in visible formula cells

Photopea (photopea.com) - a free browser image editor whose eyedropper reads the grey value at the centre of each photographed patch

Datawrapper, free plan - the chart of rupees per use against removal score, and the before-and-after bars in rupees and minutes per week

Google Drive - dated folders holding every patch photograph taken in the fixed rig

Google Docs - the protocol, the scoring scale, the one-page explainer and the interview pack

A phone camera on a taped floor mark under one lamp at a fixed distance, with no flash - the fixed rig every patch photograph is taken in

A phone camera on a taped mark under one fixed lamp records the patches, a free browser image tool reads their brightness as a second opinion on the human scores, and a spreadsheet turns doses and pack prices into rupees per use.

Act 1 – find the problem steps 1 to 5, ending with a costed problem statement

1

Pick the stain 40 MINUTES

Choose one stain that keeps coming back in this house and start counting how often it happens.

- Ask whoever does the washing which stain returns most - cooking oil, tea, ink, turmeric or grease - and write their answer down word for word.
- Count how many garments or cloths carry that stain right now and photograph them together beside a ruler.
- Start a fourteen-day household stain log with columns: date, item stained, product used, quantity used, rupees, minutes spent, result.
- Photograph the shelf of every cleaning product already in the house with the labels facing the camera, and write down each pack price and each pack quantity.
- Open a Google Sheets file named 'The Cheapest Clean' holding the stain log on one tab and the product list on another.

WRITE THIS DOWN

The chosen stain, the count of items carrying it now, the first dated row of the fourteen-day log, and every product with its pack price and pack quantity.

DONE WHEN

The log has its first dated row and every cleaning product in the house is listed with a price and a quantity taken off the pack.

Watch out. Choosing a rare, dramatic stain because it looks impressive. The number that matters is rupees per year, and that comes from the boring stain that happens weekly.

2

Make the patches 45 MINUTES

Cut one cloth into five identical patches and put an identical stain on every one.

- Take one old cotton item nobody needs and cut five squares of the same size from the same part of it, so weave and colour match across all five.
- Apply the stain with the same tool every time - one level quarter-teaspoon, or three drops from the same dropper - to the centre of each square.
- Stain all five within the same five minutes, so every patch is the same age when it is treated.
- Lay the five flat on a covered surface, label them one to five in pencil on the back so the front gives nothing away, and leave them the same number of hours to dry.
- Photograph all five together beside a ruler with the lamp already in the fixed position you will use for every later photograph.

WRITE THIS DOWN

The cloth used, the square size, the stain quantity per patch, the clock time each was stained and the drying hours before testing.

DONE WHEN

Five squares carry the same stain applied within five minutes of each other, labelled only on the back, dried for the same time.

Watch out. Cutting patches from different garments because one square was short. Different weave holds stain differently, and the test then measures cloth instead of method.

3

Fix the conditions 45 MINUTES

Write the protocol that holds everything still except the one method under test.

- Write the fixed conditions down before anything is mixed: same water volume in millilitres, same water temperature from the same tap, same contact time in minutes, same scrub count, same brush.
- Write the five-point scale out in words - five for no stain visible, four for a faint shadow, three for clearly reduced, two for barely changed, one for unchanged - and stick it on the wall.
- Set the photograph rig: same lamp, same distance, same background sheet, same time of day, no flash, and mark the phone position on the floor with tape.
- Read every hazard label aloud with an adult present and agree the rule out loud: one product per bowl, never two, and nothing heated.
- List the five methods, one per row, each with the exact dose it will be given.

WRITE THIS DOWN

The protocol as a numbered list, the five-point scale in words, the rig measurements, and the five methods with their doses.

DONE WHEN

Another person could run the whole test from your written protocol without asking you a single question.

Watch out. Deciding the scale after seeing the results. A scale written afterwards always flatters the method you were hoping would win.

4

Run the five tests 60 MINUTES**Treat the five patches under identical conditions, one method each, and photograph the result.**

- Set out five separate bowls, one per method, with gloves on, a window open and an adult in the room before anything is opened.
- Time every treatment on the same timer to the same contact time, and count the scrubs aloud so the count is on the recording.
- Rinse each patch with the same volume of water from the same tap and hang all five to dry in the same place for the same hours.
- Photograph the five dried patches in the fixed rig, together and then one by one, and file them in a dated Google Drive folder.
- Have three people score every patch against the wall scale with the labels hidden, and record all three scores separately rather than agreeing one.

WRITE THIS DOWN

The five treatments with their timings and scrub counts, the three blind scores per patch, and the mean score for each method.

DONE WHEN

Every patch carries three independent scores and a photograph taken in the same rig at the same distance under the same lamp.

Watch out. Scrubbing the stubborn patch a little longer to be fair to it. Those extra scrubs become the reason it won, and the test then measures your arm rather than the method.

5

Cost each use 50 MINUTES**Work out what one use of each method actually costs in rupees.**

- Weigh or measure each product before and after its test, or count the drops or level spoons used, and record the quantity consumed per test.
- Divide the pack price by the pack quantity in the same units, in a formula cell, to get rupees per millilitre or rupees per gram.
- Multiply by the quantity used to get rupees per use, then add water and any electricity as one line marked clearly as an estimate with the reason beside it.
- Open each patch photograph in Photopea and read the grey value at the centre of the stain with the eyedropper, recording it beside the human scores as a second, independent measure.
- Chart rupees per use against mean score in Datawrapper, one labelled point per method, titled with the finding rather than the word 'chart'.

WRITE THIS DOWN

Rupees per use for all five methods, the dose behind each figure, the eyedropper values, and the cost-against-score chart.

DONE WHEN

You can name the cheapest method that scored well and the expensive one that did not, and show the arithmetic behind both.

Watch out. Costing by pack price instead of by dose. A large expensive bottle can be the cheapest per use, and only the quantity consumed tells you which.

6 Name the cost 50 MINUTES

Finish the costed problem statement and choose the method the household will switch to.

- Write four lines: whose problem this is, how often the stain happens, what the current method costs per use and per year at that frequency, and what the winner would cost instead.
- Multiply rupees per use by the stain count from the fourteen-day log, scale it to a year in a formula cell, and write the difference as one rupee figure.
- Lay the five patches, or their photographs, in a row on the page with the five cost figures printed under them.
- Choose the winner on cost and score together and write: 'The household will use X for one month, and I expect rupees per week to fall from A to B and minutes per week from C to D.'
- Show the page to whoever does the washing and record their agreement, or their refusal, as a dated note or a voice message.

WRITE THIS DOWN

The one-page costed problem statement, the yearly figures for the current method and the winner, and the switch written as one testable sentence.

DONE WHEN

Somebody who was not there reads the page once and repeats your rupees-per-use figures back correctly.

Watch out. Picking the top score whatever it costs or however long it takes. A method nobody will keep using for a month measures nothing at all.

7 Agree the switch 40 MINUTES

Write the rules that keep the month's measurement identical to the fortnight's.

- Write what stays fixed: same log columns, same scale, same timer, same scorer, same tap, same brush.
- Write what is allowed to move: only the product used to treat the stain.
- Set the winning product aside in one container, weigh it or mark its level on day one, and photograph that starting mark.
- Add four blank labelled rows to the sheet for weeks one to four, with the dates beside them, before any data exists.
- Record a thirty-second voice note stating your prediction, dated before the month begins.

WRITE THIS DOWN

The protocol as a numbered list, the four week dates, the starting weight or level of the container, and the timestamped prediction.

DONE WHEN

The sheet holds empty labelled rows waiting for four weeks, and the prediction exists before the data does.

Watch out. Starting the month with a fresh bottle and no starting weight. Weigh or mark the container on day one, or the month's real cost can never be recovered.

8 Week one switched 20 MINUTES ACROSS THE WEEK

Run the household on the winning method for one week and log every stain event the day it happens.

- Log each event on the day: item, product, quantity used, minutes spent scrubbing, and the score after treatment.
- Weigh or mark the container at the end of the week and compare it against the sum of the logged doses.
- Photograph one treated item in the same fixed rig, so the month has a visual record beside the patch photographs.
- Write down what went wrong: a forgotten entry, somebody reaching for the old bottle, a stain treated twice, an event nobody told you about.

WRITE THIS DOWN

The week one rows complete - events, rupees, minutes, scores - the container reading, plus a dated failure entry.

DONE WHEN

Week one carries every column the baseline fortnight had, and the failure log holds at least one honest entry.

Watch out. Reconstructing the whole week from memory on Sunday. Entries written days later lose the minutes, and minutes are half the finding.

9

Weeks two to four 60 MINUTES ACROSS THREE WEEKS**Finish the month, normalise both periods and compare them honestly.**

- Keep logging every stain event for three more weeks, changing nothing the protocol does not allow.
- Divide the baseline fortnight and the switched month each by their number of weeks, in formula cells, to get rupees per week and minutes per week.
- Chart the two periods in Datawrapper: two bars for rupees per week, two bars for minutes per week, on stated axes.
- List every confounder you can name: fewer stains this month, a cook away from home, a price change, warmer water, somebody scrubbing harder than before.
- State the change as a rupee figure, as a percentage and in minutes, and say plainly whether one month is enough to be sure.

WRITE THIS DOWN

The two comparison charts, the per-week figures for both periods, the difference in rupees and minutes, and the confounder list.

DONE WHEN

You can state the before figure, the after figure, and at least two reasons the difference might not be your doing.

Watch out. Comparing a fortnight's total against a month's total. Normalise both to the same length or the switch will look twice as expensive as it is.

10

Share and reflect 60 MINUTES**Publish the finding, defend it to real people, and record what the household will keep.**

- Record a defence video of no more than three minutes: the stain, the controls, the five patches, the costs per use, the switch, the month and the limits.
- Show the one-page explainer to three people who wash clothes in this house or nearby and write down what each of them said.
- Send the cost-against-score chart to the expert you interviewed with one question: what would you have controlled that I did not.
- Ask the household on camera whether the switch stays and why, and let them answer without prompting.
- Complete the relations ledger with ten names, roles, dates and what each person replied.

WRITE THIS DOWN

The defence video, the one-page explainer, and the relations ledger holding ten logged relationships.

DONE WHEN

Ten relationships are logged with dates and replies, and the household has said on record whether the switch stays.

Watch out. Calling it a success because the house smells better. The metric is rupees per week and minutes per week - report those first and opinions second.

Your nine deliverables in this project**1 - RESEARCH - WEEK 2****Question card**

One card naming the stain, the cloth, the five methods already in the house, and the question: which one shifts this stain best, and what does each cost per use.

2 - OUTREACH - WEEK 3**Expert interview pack**

Five written questions for a dry cleaner, housekeeping supervisor or formulation chemist, your cost-against-score chart attached, the date and channel of the request, and the reply recorded word for word.

3 - RESEARCH - WEEK 4**Evidence log**

Every dose measured, every contact time and scrub count, all three blind scores per patch, every pack price with its pack quantity, and every stain event logged on the day it happened.

4 - PROCESS - WEEK 5**Failure log**

The patch scrubbed longer than the protocol allowed, the entry written three days late, the week somebody used the old bottle, and what each one did to the comparison, all dated.

5 - DESIGN - WEEK 5

The build

The test set-up itself - five bowls, one brush, one timer, the fixed photograph rig or the drawn scale - with the five patches in a row and the cost-against-score chart.

7 - BRANDING - WEEK 5

Identity card

A name and a one-line promise for the winning method, so the household can refer to it by name, plus the single sentence you want repeated in somebody else's kitchen.

9 - DEFENCE - WEEK 6

Defence video

Under three minutes on camera: the stain, the controls held still, the five scores, the rupees per use, the switched month, and the limits you accept without argument.

6 - DESIGN - WEEK 5

One-page explainer

One page a neighbour reads in ninety seconds: the stain, the five methods, the rupees per use beside each score, the switch, the month's result, and what this cannot tell them.

8 - OUTREACH - WEEK 6

Relations ledger

Ten names with dates and replies: one cleaning professional or chemist, three people who wash clothes here, three peers who checked your controls, and three people you sent the chart to who answered.

The four tiers, in this project

Starter

You run five methods on five identical patches, score them against a scale written beforehand, cost each per use from the pack price, and question one stranger who cleans for a living.

Researcher

You write the protocol before the first patch, justify three blind scorers and the dose you chose, and quantify the error added by your eye, your water and a single run per method.

Practitioner

You choose the stain and defend the choice, cite the pack price and pack quantity behind every cost figure, and make one chart of cost against score that a stranger reads correctly unaided.

Contributor

You set your ranking against a published cleaning or surfactant study, defend your controls to a chemist who disagrees, and publish your raw scores, doses and patch photographs openly.

The one expert you must talk to

Who. A dry cleaner or laundry owner, a hotel or hospital housekeeping supervisor, a formulation chemist at a soap or detergent maker, or a quality-control chemist who tests cleaning products for a living.

Where to find one. Walk into a dry cleaner mid-morning when the counter is quiet and ask for the person who treats the stains. A hotel front desk will pass a polite request to the housekeeping supervisor. Chemistry departments publish staff emails. Soap and detergent factories list a public number that reaches a quality lab. Search LinkedIn for 'formulation chemist' plus your city.

SEND EXACTLY THIS

Hello, my name is [name]. I have tested five household cleaning methods on five identical stained patches, holding water, time and scrubbing constant, and costed each one per use. Two of my results surprise me. Could you spare fifteen minutes this week to tell me what I have got wrong? I will send my five questions first.

Ask them

1. When you test whether a treatment works, what do you hold constant, and which of those has caught you out before?
2. How do you decide a stain is gone - by eye, against a scale, or by something you actually measure?
3. What do you pay per use for the product you reach for most, and how do you know that figure?
4. Which household remedy do customers believe in that you have watched fail on your own bench?
5. If a stain like mine arrived at your counter, what would you do first, and why that first?

You will be asked, without warning

1. Would the household's cleaning spend have fallen anyway this month without your switch, and how do you know?
2. Three people scored your patches by eye. What would two more scorers have done to your ranking, and how exactly did you stop them seeing which method was which?
3. Each method got one patch. Convince me one run per method is enough, and tell me what a second run would most likely have changed.
4. A neighbour has harder water and a different cloth. Which part of your result travels to their house, and which part stays in yours?

If you get stuck

- If nobody replies to your interview requests - then walk into a dry cleaner at a quiet hour and ask the person at the counter two questions while they work.
- If your before and after look the same - then report that as the finding, check first whether the household actually used the winning method on every stain event, and write what you find in the failure log.
- If you cannot weigh the product used - then count level quarter-teaspoons or drops from the same dropper, weigh one dose once on a shop's scale, write that conversion at the top of the page, and mark the row as estimated.
- If you run out of time - then shorten the switched period to two weeks rather than dropping the baseline fortnight, normalise both to rupees per week, and print the shortened period on the chart itself.

Finished early?

Run the same five methods against a second stain and find out whether the winner holds or whether the ranking turns over completely.

The Question Nobody Asked

Ask twenty neighbours what quietly wastes their time, then add up the hours your street loses every month.

THE QUESTION

What is the one problem the people on your street raise without being prompted, and how many hours or rupees does it take from every household each month?

Councils, utilities, housing developers and every organisation that serves a neighbourhood spend money on problems that were assumed rather than asked about, and the assumed problem is rarely the expensive one. Finding the real one takes a fixed open question, verbatim answers, honest grouping and a cost per household that somebody can check. That is the method behind community needs assessment, service design and municipal budgeting, and it is paid work precisely because most organisations skip it and pay twice.

ACT 1 - FIND

You ask fifteen to twenty households on one street or in one building the same open question - what is the one thing here that wastes your time or your money that nobody has ever asked you about - and you write every answer down in the words used rather than in your summary of them. You then group the answers, find the problem raised unprompted most often, and cost it in minutes per household per week or rupees per household per month, from timings you take yourself and figures residents actually reported.

A one-page costed problem statement carrying four lines: how many households you asked and how many refused, how many raised this problem unprompted, the cost per household per week or per month with each figure marked measured or reported, and the total hours or rupees the street loses every month. Beside it sits a bar chart of problems by count, largest first.

ACT 2 - FIX

You organise one small change with at least three neighbours - a shared rota, a sign, a bin moved, a step repaired, one pooled purchase - with permission from whoever is responsible for the space, and you keep it running for fourteen days while logging every time it fails. You then measure the identical quantity again, in the same households, at the same time of day, with the same timing rule.

A two-bar chart of minutes per household per week, before against after, with the recalculated street total per month, the difference stated in hours or rupees, a dated log of every day the change broke or was ignored, and a named list of everything else that could explain the difference.

YOU MEASURE

minutes lost per household per week on the problem residents raise most, totalled as hours across the street each month

BEFORE

Three timings taken by you of the activity itself, plus how often it happens per week as reported by each household to a fixed question, multiplied out per household and scaled to the street by the median. Every figure is marked measured or reported and the two are never mixed in one total without saying so.

AFTER

The identical activity timed three times again with the same watch, the same frequency question read word for word, in the same coded households and at the same time of day, fourteen days after the change was put in place.

Safety and ethics - not optional

- Never go alone. A named adult knows the street, the hours you will be there and when you will be back, and for anyone under eighteen that adult goes with you and stays within sight for every doorway.
- Never enter anyone's home. Ask at doorways, at gates or in shared public space, in daylight only, and finish before dark.
- Record no names, no house numbers, no telephone numbers and no photographs of people. Every household is a code number, and any photograph of the place is taken with nobody in the frame.
- Anybody may decline. Count refusals and never chase them, never call twice at the same door, and if anyone becomes angry leave immediately, say nothing back, and write down what happened as soon as you are away.

WHAT YOU USE - HIGH-TECH ROUTE

Google Forms - the one open question and the fixed follow-ups, filled in by you at the doorway so every response arrives in the same structure

Google Sheets - the verbatim answers one per row, the grouping labels, and the minutes-and-rupees arithmetic in visible formula cells

Datawrapper, free plan - the bar chart of problems by count and the before-and-after chart of minutes per household per week

Google Docs - the costed problem statement, the protocol, the one-page explainer and the expert interview pack

Google Drive - dated folders holding the street sketch, the rota sheet and photographs of the change with nobody in the frame

A phone at the doorway and a browser afterwards: a free form captures every answer in the same structure, a free spreadsheet holds the verbatim text and the arithmetic, and a free chart tool turns the count and the before-and-after into two pictures.

Act 1 – find the problem steps 1 to 5, ending with a costed problem statement

1 Choose the street 45 MINUTES

Pick one street or one building, tell a named adult where you will be, and fix the single question you will ask everyone.

- Sketch the street or the building with every household as a numbered box, and write no house number and no name on the sketch.
- Write the question once and never change it: 'What is the one thing here that wastes your time or your money that nobody has ever asked you about.'
- Tell a named adult the street, the hours you will be there and when you will be back, and for anyone under eighteen arrange for that adult to come along and stay within sight.
- Write the opening line you will say at every door: who you are, what the question is for, how long it takes, and that they are free to say no.
- Build a Google Form with three fields: household code, the answer typed word for word, and a refusal box.

WRITE THIS DOWN

The coded street sketch, the question in its final wording, the doorway opening line, and the name of the adult who holds the plan.

DONE WHEN

The question exists in one fixed wording, every household is a code number, and a named adult knows the street and the hours.

Watch out. Writing a question that suggests its own answer, such as asking about rubbish or about water. An open question collects what people actually think; a narrow one collects what you already believed.

2

Ask the doorways 3 HOURS OVER THREE DAYS

Put the same open question to fifteen to twenty households and write every answer down word for word.

- Call in daylight, at the doorway, the gate or the shared space, and never step inside for any reason.
- Read the question exactly as written and then stop talking, however long the silence runs.
- Type the answer verbatim into the form, in the words used, including the repetition and the hesitation - do not tidy it and do not shorten it.
- Where an answer is long, read it back and ask whether you have written what they meant, then correct it in front of them.
- Log every refusal as a refusal against a household code and move on without asking twice.

WRITE THIS DOWN

Fifteen to twenty verbatim answers against coded households, the refusal count, and the time of day each door was called at.

DONE WHEN

Every answer sits in the resident's own words, refusals are counted, and no name, house number or photograph of a person exists anywhere.

Watch out. Typing 'complains about water' instead of what they said. The exact words are the data; your summary is your opinion wearing their coat.

3

Group the answers 60 MINUTES

Sort the verbatim answers into groups and find the problem raised unprompted most often.

- Pull the form responses into Sheets, one answer per row, and read all of them through once before labelling anything.
- Label each answer with a group name taken from the residents' own words rather than a category you invented.
- Count how many households raised each group, and separately how many raised it first, before anything else in their answer.
- Ask one person who did not do the survey to group the same answers blind, then compare their grouping with yours row by row.
- Chart the groups in Datawrapper, largest first, with the count printed on each bar.

WRITE THIS DOWN

The grouped table, the count per group, the first-mention count, and every row where your grouping and the blind grouping disagreed.

DONE WHEN

One group carries the highest count, and a second person grouping blind put broadly the same answers into it.

Watch out. Merging two different problems into one large group to make the count look better. Keep them apart and report both counts, even when neither wins clearly.

4

Cost it per household 90 MINUTES

Turn the top problem into minutes per household per week or rupees per household per month, measured wherever it can be measured.

- Return to five households who raised it and ask two fixed questions: how long does it take each time, and how many times a week does it happen.
- Time it yourself wherever it can be timed - the walk, the queue, the wait, the second trip - three separate times, and record all three timings rather than an average.
- Check any price yourself at the shop or the office rather than accepting a remembered figure.
- Put every household's figure in its own row and calculate the median as well as the mean, because one extreme household drags a mean a long way.
- Mark every figure as measured or reported, and never add the two into one total without saying which is which.

WRITE THIS DOWN

Minutes per household per week or rupees per household per month, each marked measured or reported, with the median and the mean side by side.

DONE WHEN

Every figure traces either to a timing you took or to a sentence a resident actually said, and each one is labelled which.

Watch out. Asking 'roughly how long does it take' and accepting the first answer. Ask how long each time and how often, then multiply - people badly underestimate what they do daily.

5

Total the street 45 MINUTES

Scale the per-household cost to the whole street each month and check that total with residents themselves.

- Multiply the median per-household figure by the number of households on the street and then by the weeks in a month, with the arithmetic sitting in visible formula cells.
- State how many households you actually asked against how many exist, because every household you did not ask is an assumption and must be labelled one.
- Convert minutes into hours at the end rather than in the middle, and round exactly once.
- Read the total back to three residents and write down whether each said it sounds high, low or about right.
- Write one line naming what would make this total wrong and roughly by how much.

WRITE THIS DOWN

The street total in hours or rupees per month, the arithmetic, the sample size against the street size, and the three residents' reactions word for word.

DONE WHEN

You can say the total in one sentence and immediately name the assumption it rests on.

Watch out. Presenting a total as measured when most of it was scaled from five households. Say plainly what you measured and what you multiplied.

6 Name the cost 50 MINUTES

Finish the costed problem statement on one page and agree one small change with at least three neighbours.

- Write four lines: whose problem this is, how many households raised it unprompted, the cost per household, and the total hours or rupees the street loses each month.
- List three changes that need nothing bought: a shared rota, a sign, a bin moved, a step repaired, one pooled purchase.
- Take the page back to the households who raised it, ask which change they would actually take part in, and write down the refusals as carefully as the agreements.
- Get three neighbours to take a role each, recorded by household code, with what they agreed to do and on which days written beside the code.
- Write the prediction as one sentence: 'We will do X for fourteen days and expect minutes per household per week to fall from A to B.'

WRITE THIS DOWN

The one-page costed problem statement, the three candidate changes, the roles agreed against household codes, and the dated prediction.

DONE WHEN

Three neighbours have each taken a named role, and the prediction is written down before anything changes.

Watch out. Choosing the change you can organise on your own. A change with no neighbours inside it measures your effort, not the street's problem.

7 Set it up 60 MINUTES

Put the change physically in place and fix the rules that keep the after-measurement identical to the before.

- Ask whoever is responsible for the space before anything is moved, repaired or fixed to a wall, and record the permission by role rather than by name.
- Make the thing itself: type and print the rota, letter the sign in Docs, move the bin, repair the step with what is already to hand.
- Write what stays fixed: same coded households, same question wording, same watch, same three-timing rule, same time of day.
- Put both dates in a shared calendar - the start and the re-measurement fourteen days later - and tell the three neighbours both of them.
- Photograph the sign, the rota or the repair with nobody in the frame and file it in a dated Drive folder.

WRITE THIS DOWN

The protocol as a numbered list, the permission recorded by role, the two dates, and the dated photograph of the change itself.

DONE WHEN

The change is physically in place, permission is on record, and the re-measurement date is fixed before any after-data exists.

Watch out. Fixing something in a shared space without asking first. Ask; a change removed in three days by whoever owns that wall measures nothing at all.

8

Run the fortnight 45 MINUTES ACROSS TWO WEEKS**Keep the change running for fourteen days and log what actually happens to it, including the days it fails.**

- Check the rota, the sign or the repair every second day and write one line on its condition with the date.
- Log every time it is ignored, removed or complained about, with the date and no name attached.
- Ask the three neighbours once a week whether they are still doing their part, and record the honest answer rather than the polite one.
- Where it breaks, put it back once and record that you did, then leave it alone if it breaks again.
- Write a dated failure entry each week whether or not anything went wrong.

WRITE THIS DOWN

A dated condition log every second day, every failure with its date, and the three neighbours' weekly answers in their own words.

DONE WHEN

Fourteen days of dated entries exist, including the days nothing happened, and every failure is written down rather than repaired quietly.

Watch out. Quietly fixing the change every morning so it looks like it worked. Record the repairs; the effort of keeping it alive is part of what it costs.

9

Measure again 90 MINUTES**After fourteen days, measure the same quantity in the same households, in the same way, and compare.**

- Return to the same coded households in the same order and at the same time of day, including those who chose not to join the change - but never to a household that asked not to be called on again.
- Time the same activity with the same watch and the same three-timing rule, recording all three timings again.
- Read the frequency question from the page word for word, exactly as it was asked the first time.
- Recalculate minutes per household per week and hours across the street per month using the identical arithmetic in the same cells.
- Chart before against after in Datawrapper as two bars, and list every confounder: weather, a holiday, a repair by somebody else, a household that moved, a shop that closed.

WRITE THIS DOWN

The after figure for each coded household, the new street total, the difference in hours or rupees per month, and the confounder list.

DONE WHEN

Before and after exist for the same coded households, measured identically, and at least two reasons the difference might not be yours are named.

Watch out. Re-asking only the households that joined in. Ask everybody you asked the first time, including the ones who declined, or your after-number is a survey of your own supporters.

10

Share and reflect 60 MINUTES**Publish the finding back to the street, defend it, and record whether the change stays.**

- Record a defence video of no more than three minutes: the question, what people actually said, the cost, the change, the after number and the limits.
- Put the one-page explainer where the street can read it, with permission from whoever owns that wall or board, and with no names on it.
- Send the before-and-after chart to the expert you interviewed with one question: what would you have measured that I did not.
- Ask the three neighbours on record whether the change stays now that the fortnight has ended, and write each answer word for word.
- Complete the relations ledger with ten entries - names for the expert, the peers and the people you shared with, codes for every resident.

WRITE THIS DOWN

The defence video, the one-page explainer, and the relations ledger holding ten logged relationships with dates and replies.

DONE WHEN

Ten relationships are logged with dates and replies, and the street has been given the after-number whether it improved or not.

Watch out. Publishing only because it worked. A street that lost the same hours after fourteen days is a finding - say so, and say what you think stopped it working.

Your nine deliverables in this project**1 - RESEARCH - WEEK 2****Question card**

One card carrying the single open question in its final wording, the street as a coded sketch, and the number of households on it against the number you intend to ask.

2 - OUTREACH - WEEK 3**Expert interview pack**

Five written questions for a social worker, councillor or municipal officer, your grouped answers and street total attached as one page, the date of the request, and the reply word for word.

3 - RESEARCH - WEEK 4**Evidence log**

Every answer in the resident's own words against a household code, the refusal count, all three timings for each measurement, and every figure marked measured or reported.

4 - PROCESS - WEEK 5**Failure log**

The doors that never opened, the answers you had to summarise and why, the days the rota was ignored, the resident who became angry and what you did, all dated.

5 - DESIGN - WEEK 5**The build**

The change itself - the rota sheet, the lettered sign, the moved bin, the repaired step - photographed with nobody in the frame, plus the two-bar before-and-after chart of minutes per household.

6 - DESIGN - WEEK 5**One-page explainer**

One page a neighbour reads in ninety seconds: the question asked, what people said, the cost per household, the street total per month, the change, and the after number.

7 - BRANDING - WEEK 5**Identity card**

A name and a one-line promise for the change, so neighbours can refer to the rota or the sign by name, plus the single sentence you want repeated at the next doorway.

8 - OUTREACH - WEEK 6**Relations ledger**

Ten entries with dates and replies: one social worker or municipal officer, three residents the problem affects by code, three peers who checked your grouping, three people you shared with who answered.

9 - DEFENCE - WEEK 6**Defence video**

Under three minutes on camera: the question, the counts, the cost per household, the street total, the change, the after number, and the limits you accept without argument.

The four tiers, in this project

Starter

You ask fifteen to twenty households one fixed open question, record every answer word for word, cost the top problem, and put your questions to one social worker or community organiser.

Practitioner

You choose the street and defend the choice, have a second person group your answers blind and report where you disagreed, and make one chart a stranger reads correctly unaided.

Researcher

You fix the wording and the timing rule in writing before the first doorway, justify your sample against the number of households on the street, and quantify what refusals do to the street total.

Contributor

You set your street's figure against a published municipal or academic estimate for the same problem, defend your method to a councillor or municipal officer, and publish your coded data openly.

The one expert you must talk to

Who. A social worker, a union council member or councillor, a community organiser, or a municipal officer responsible for this area. A shopkeeper who has stood on that street for years hears every complaint before the council does and counts as an expert here.

Where to find one. Union council and ward offices keep public hours and a complaints desk. Municipal corporations publish a sanitation or works officer for each area. Organisations working locally list a field coordinator on their site. The oldest shop on the street is open now, and the person behind the counter has heard the problem for years.

SEND EXACTLY THIS

Hello, my name is [name]. I asked eighteen households on one street one open question: what wastes your time or money here. I wrote every answer word for word, and one problem came up far more than the rest. Could you spare fifteen minutes this week to check my costing of it? I will send five questions first.

Ask them

1. When you want to know what a street actually needs, what do you ask, and what have you learnt never to ask?
2. Which problems do residents raise unprompted, and which ones do they only mention when you name them first?
3. How do you put a cost on something like waiting or walking, and what figure would a council accept from me?
4. What small changes have you seen a handful of neighbours make stick, and what did the ones that failed have in common?
5. If I brought you this street total tomorrow, what is the first thing you would check before believing it?

You will be asked, without warning

1. Would this change have happened anyway without your organising, and how do you know?
2. You scaled a handful of households to the whole street. Name the households that would break that total, and say by how much.
3. You wrote the answers verbatim and then grouped them yourself. Show me one grouping decision you got wrong, and what it did to the count.
4. Two weeks after your fortnight ended, is the rota still running, and what is your number worth if it is not?

If you get stuck

- If nobody will open the door - then ask in public space instead, at the shop, the gate or the water point, and record every refusal with the time of day it happened.
- If your before and after look the same - then report it as the finding, check first whether the change was actually kept on all fourteen days, and write what you find in the failure log.
- If you cannot time the thing - then ask five households how often and how long each time, mark every figure reported rather than measured, and print that on the chart itself.
- If you run out of time - then shorten the after-period to seven days rather than dropping the baseline, and state the shortened period on the chart itself.

Finished early?

Ask the identical question on a second street with the same problem but no change made, and set the two after-totals side by side.

When you have finished

There is no separate portal, and the assessment itself is free.

1. Fill in the **Project Assessment & Submission Template** - free at earlyagedevelopment.com/EAD_Labs.html
2. Put it in a document, or scan your pages, and set the link so anyone with it can view
3. Open **Book Free Consultation** at the bottom of earlyagedevelopment.com
4. Tick **"Others"** and paste your link with the project name and route

Assessment comes back within two weeks

Written feedback on every section, a mark out of twenty, and unlimited free resubmissions. Passing activates your EAD Labs Community membership - which is earned by finishing one project, not bought.

Everything here is free, and stays free

Run it with thirty learners or with one. The full facilitator pack - handbook, marking rubric, checkpoint cards and class tracker - is also free at earlyagedevelopment.com/EAD_Labs.html, and one teacher per school is trained free.

Want this with your school's name on it? We print school-branded editions - your logo on the cover, ours beneath it - and deliver the copies to your campus. Write to support@earlyagedevelopment.com with the route and the number you need.

The gate is the assessment, never the fee. If a learner passes and cannot pay for certification, a school, a sponsor or the community fund covers them.

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Notes

Your before figure, your one change, the dates you took each reading, and anything that went wrong. Keep it here rather than on loose paper - the failure log carries six of the twenty marks.

Your ten relationships

One expert, three people the problem affects, three peers who reviewed it before you finished, and three people you showed the finished work to who replied. Name, role, date, and what they said. Ten logged relationships are a gate, so keep this page complete as you go.

Notes

Your before figure, your one change, the dates you took each reading, and anything that went wrong. Keep it here rather than on loose paper - the failure log carries six of the twenty marks.

Their students apply with a CV. Ours apply with proof.

Every project in this booklet ends the same way: a number measured before a change, the same number measured after it, and an honest answer about what caused the difference. That is what a learner walks out holding.

HOW ONE PROJECT RUNS - ABOUT SIX WEEKS

Act 1 - Find

Steps 1 to 5. Measure something ordinary until you can say what it costs, per week or per year.

The gate

A before figure, dated, with its instrument and method written beside it. Nothing is marked without one.

Act 2 - Fix

Steps 6 to 10. Change one thing. Measure the same quantity the same way. Report what happened.

The defence

Ten to twelve minutes of unseen questions. It carries more marks than everything else put together.

WHAT YOU HAND IN - NINE THINGS

- **Question card** and **evidence log** - the quantity, the unit, every dated reading
- **Expert interview pack** - one person who does this for a living
- **Failure log** - what slipped, and what each slip cost the comparison
- **The build**, the **one-page explainer** and the **identity card**
- **Relations ledger** - ten named people with dates and replies
- **Defence video** - under three minutes, on camera

HOW IT IS MARKED

6

the artefact

6

process and
failures

8

the defence

- **Two gates, neither waivable.** Ten logged relationships, and a baseline taken before the change
- **AI marks. Humans certify.** Feedback on every section within two weeks
- **Tiers, never ages.** Starter, Practitioner, Researcher, Contributor - declared, not assigned

A well-measured failure scores higher than an unmeasured success.

If the change did not work and you measured it properly, say so plainly. It costs you nothing and it is worth more than a tidy number nobody can check. That rule is printed in the marking bands, not just in the guidance.

Put your school's name on this cover

WE PRINT IT AND DELIVER IT

- 1 **Your logo on the front, ours beneath it.** The interior is unchanged, so it is a cover swap rather than a new booklet.

- 2 **We print and deliver to your campus.** Tell us the route and how many copies you need.

- 3 **One of your teachers is trained free.** Half a day, online, enough to run three projects with a class.

Write to support@earlyagedevelopment.com with your school name, the route and the number of copies.



EAD - Early Age Development

All twelve projects, both routes, the assessment template, the marking rubric, the facilitator handbook, the checkpoint cards and the class tracker are free at

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