



PROBABILITY OF SUCCESS.

STUDY GUIDE

Make the call. Run it a thousand times. Learn why a good decision and a good result are not the same thing.

FOR

The leader making the calls (you)

LEVELS

46, in six chapters

PER LEVEL

About 3 to 5 minutes

ORDER

Any chapter, any time

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This guide never tells you which option is best or what the chances are. It sets out each situation and the options, gives you questions to think about before and after you play, and leaves room for your notes. The working out is yours, and the game will show you the evidence.

Welcome: you are the one making the call

In **Probability of Success** you play a leader in an organisation. Each level puts a decision on your desk: which schedule to set, how many pilots to fund, how big an audit to run, which voting rule a board should use.

None of these decisions comes with a guarantee. Stakeholders may say no, candidates may arrive in the wrong order, a supplier may let you down. What you can control is the **approach** you choose. The game asks you to choose the approach that gives your organisation the best chance, then shows you what happens, once and then a thousand times.

The scenarios are inspired by classic probability problems, including puzzles made famous by the statistician Frederick Mosteller, retold as business decisions. You do not need to know any formulas to start. You need curiosity, a pencil and a willingness to test your hunches.

WHAT YOU WILL PRACTISE

- Turning a business situation into a clear question about chance.
- Predicting which approach succeeds more often, and saying why.
- Using many simulated runs to check a prediction.
- Explaining a result with an intuitive argument and with mathematics.
- Carrying a lesson from one story into a different workplace.

THE SIX CHAPTERS

- **1 · The Opening** (levels 1 to 10)
- **2 · The Odds** (levels 11 to 16)
- **3 · The Search** (levels 17 to 24)
- **4 · The Crowd** (levels 25 to 31)
- **5 · The Sequence** (levels 32 to 37)
- **6 · The Signal** (levels 38 to 46)

HOW TO USE THIS GUIDE

Before a level, read the situation and options here and answer the “before you play” questions. Make a prediction. Then play: one round, then 1,000 simulations, then open the proofs. Afterwards answer the “after you play” questions and write a note in your own words. Play the chapters in any order your teacher sets.

How a level works

- 1 **The brief.** A photo, a title and a short mission describe the situation, the numbers you can rely on and what counts as success.
- 2 **Choose your move.** Two to four image cards show the approaches you can take. Select one, then press *Commit & play*. You can use the mouse, touch or the keyboard (Tab to move, Enter or Space to choose).
- 3 **One simulated round.** The game plays your choice once, using chance. The banner says **TARGET MET** or **TARGET MISSED** for this round, with a line explaining what happened.
- 4 **The strategy verdict.** Separately, the game tells you whether your approach has the **HIGHEST SUCCESS CHANCE** or a **LOWER SUCCESS CHANCE** among the options. One level compares expected value instead, and estimation levels ask you to look at repeated results.
- 5 **Play again, or run 1,000 simulations.** Repeat the same choice once more, or a thousand times in one go. The meter shows how often the target was met.
- 6 **Change decision.** Try the other options and compare their rates. This is the heart of the game.
- 7 **The reveal.** A short explanation of the pattern and a management takeaway. Two optional proofs open on request: an *intuitive proof* in plain language and a *mathematical proof* with the calculation.
- 8 **Next level or the map.** Explored levels are marked on the chapter map.

TWO VERDICTS, TWO DIFFERENT QUESTIONS

TARGET MET / MISSED answers: *did it work this time?* That depends on luck.

HIGHEST / LOWER SUCCESS CHANCE answers: *was it a good policy?* That depends on your judgement. You can make the best choice and still miss the target, or make a weaker choice and get lucky.

A GOOD HABIT

Write down a prediction before you commit. After 1,000 simulations, compare it with the rate on the meter. Then change decision and run the other options. Replaying is not cheating; it is how you collect evidence.

Judging a decision, not a result

A lucky result does not prove a good policy, and an unlucky one does not prove a bad policy.

Imagine two managers. One picks an approach that works seven times in ten and is unlucky this week. The other picks an approach that works three times in ten and gets lucky. If you judge them on this week's result, you will praise the wrong person. Over a year of decisions, the first manager will do much better.

This is why the game separates the round result from the strategy verdict, and why it lets you run 1,000 simulations. One round shows you an **outcome**. Many rounds show you the **chance**.

CHANCE

A property of the approach: how often it would succeed if you could repeat the situation many times. You choose it.

OUTCOME

What actually happened on one occasion. Chance shapes it, but luck decides it. You do not control it.

Why a thousand runs?

With a handful of rounds, a weaker approach can easily look better. As the number of runs grows, the observed rate settles near the true chance. This is the *law of large numbers*. A thousand runs is usually enough to separate options that differ clearly; options that are very close may still need careful thought, or the proof.

Is the highest chance always the best decision?

Not always. Some options cost more, need more oversight, or protect things the target does not measure. The game's verdict compares **success chance only**. When you discuss a level, ask what else a sensible leader would weigh: cost, fairness, risk to people, reputation, or what happens next time.

TRY THIS

In any level, play one round of each option and note which met the target. Then run 1,000 simulations of each. Did the single rounds tell the same story as the batches?

Six ideas you will meet again and again

1 • CHANCE VERSUS OUTCOME

A probability describes the long run. A single result can go either way. Judge an approach by its chance, then check that chance with many runs.

2 • EXPECTED VALUE

When results have different sizes, not just “win” or “lose”, multiply each possible value by its probability and add them up. That long-run average is the expected value. An option can win more often and still be worth less on average.

3 • INDEPENDENCE

Two events are independent if one happening does not change the chance of the other. Many briefs say “outcomes are independent”. Real life often is not: two backups can share a site, a panel can share a blind spot. Always ask whether the assumption is reasonable.

4 • “AT LEAST ONE” AND THE COMPLEMENT

The chance of at least one success is often easiest to find by working out the chance of *no* success and taking it away from 1. The same trick helps with coincidences and coverage.

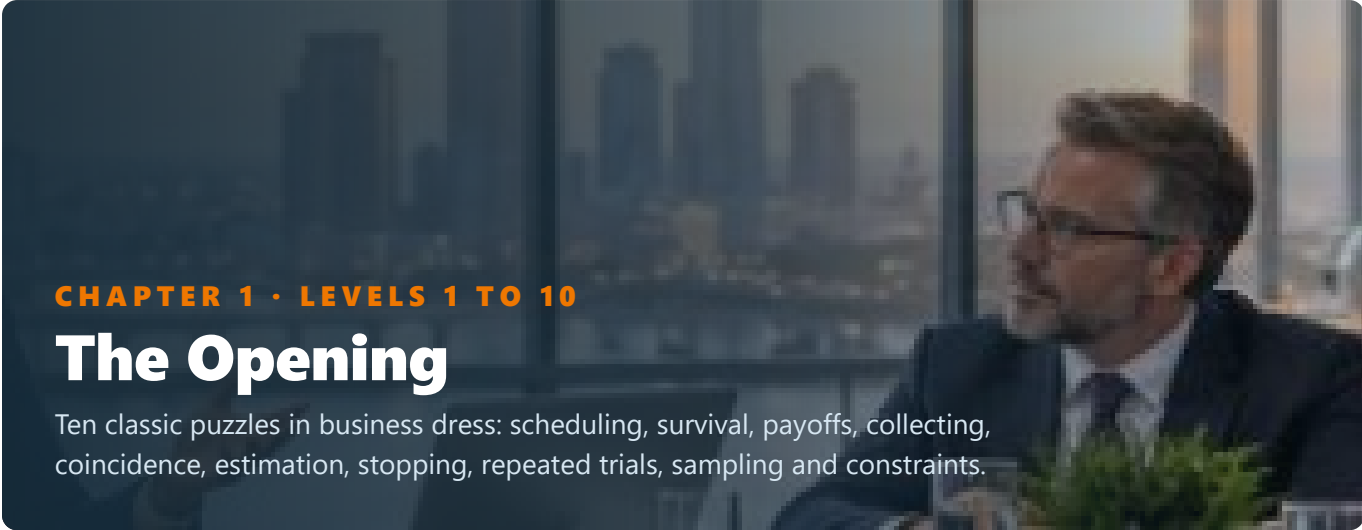
5 • SAMPLING WITH AND WITHOUT REPLACEMENT

If you check an item and put it back, you might check it again. If you set it aside, the remaining pool changes after every check. Audits, inspections and surveys depend on which of these is true.

6 • BASE RATES

How common something is before you test for it matters enormously. When a problem is rare, even a good test can produce more false alarms than real finds. Start every judgement about evidence with the base rate.

Other ideas, such as optimal stopping, random walks, collisions, reliability of chains and committees, and estimating an unknown total, appear in particular chapters. The glossary at the back explains each term.



CHAPTER 1 · LEVELS 1 TO 10

The Opening

Ten classic puzzles in business dress: scheduling, survival, payoffs, collecting, coincidence, estimation, stopping, repeated trials, sampling and constraints.

In this chapter you will play 10 levels. For each one, read the situation, answer the questions before you play, make a prediction, then play and test it.

LEVEL	TITLE	THEME	EXPLORED
1	The Pitch	Strategy · sequencing	☐
2	The Runway	Risk · survival	☐
3	Strategic Partnership	People · incentives	☐
4	Capability Build	People · completion time	☐
5	Hidden Connections	Judgement · coincidence	☐
6	Competitor Intelligence	Strategy · inference	☐
7	The Appointment	People · optimal stopping	☐
8	Product Experiments	Innovation · repeated trials	☐
9	Quality Audit	Operations · sampling	☐
10	The Budget Split	Operations · constraints	☐



LEVEL 01 · THE OPENING

The Pitch

STRATEGY · SEQUENCING

Three stakeholder meetings. Two consecutive approvals. Which schedule gives your project its best chance?

THE SITUATION

Your expansion needs **two approvals in a row** across three meetings. A receptive stakeholder approves 70% of the time; a difficult one approves 35%. Outcomes are independent. Choose the schedule before you begin.

Target: Successful decisions

YOUR OPTIONS

OPTION A

Receptive → Difficult → Receptive

Two easier meetings, with the difficult one in the middle.

OPTION B

Difficult → Receptive → Difficult

The receptive meeting occupies the critical middle position.

KEY TERMS

Independent events

Inclusion–exclusion

Simulation

BEFORE YOU PLAY

1. List every pattern of approvals and refusals across the three meetings that would count as two approvals in a row.
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Which meeting appears in every winning pattern? How did that change your view of the two schedules?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: “When a process needs adjacent wins, identify the position every successful path passes through.” Describe a workplace or school situation where this would apply.

NOTES



LEVEL 02 · THE OPENING

The Runway

RISK · SURVIVAL

A promising initiative can still bankrupt the organisation before it pays off.

THE SITUATION

You have **4 months of runway**. Each pilot independently has a 55% chance to add one month and a 45% chance to consume one. Reach 7 months to secure funding; hit zero and the company closes. Choose how far to push before taking a certain bridge.

Target: Successful decisions

YOUR OPTIONS

OPTION A

Stop at 5 months

A smaller funding round if you reach 5 before insolvency.

OPTION B

Push for 7 months

A larger round, but more time exposed to failure.

KEY TERMS

Random walk

Absorbing boundary

Risk of ruin

BEFORE YOU PLAY

1. A 55% chance of gaining a month sounds favourable. What could still go wrong on the way to 7 months?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why might a target that is further away be reached less often, even when the odds of each step are in your favour?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Separate the value of an outcome from the chance of surviving long enough to reach it." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 03 · THE OPENING

Strategic Partnership

PEOPLE · INCENTIVES

A shared opportunity only works if each leader can trust the other to cooperate.

THE SITUATION

Two firms simultaneously decide whether to **share their research** or hold it back. Your counterpart shares in 60% of rounds. Shared cooperation produces a stronger market launch. The score measures your organisation's value this round.

Target: High-value rounds (6+) · This level also compares the average value of each choice.

YOUR OPTIONS

OPTION A

Share openly

If both share: +6. If they hold back: 0.

OPTION B

Protect your research

If they share: +8. If both protect: +2.

KEY TERMS

Expected value

Payoff table

Dominant strategy

BEFORE YOU PLAY

1. Your counterpart shares in 60% of rounds. Apart from that rate, what would you need to know to choose well?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. The share of high-value rounds can look similar for both choices. What did the average value per round show instead?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Map both organisations' incentives before asking a team to "just collaborate"." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 04 · THE OPENING

Capability Build

PEOPLE · COMPLETION TIME

A team is only ready when every critical capability is represented.

THE SITUATION

Five equally common specialist capabilities are available. Every recruitment draw is independent and may duplicate one already on the team. You have a hiring window. Choose the number of candidate contacts to fund.

Target: Successful decisions

YOUR OPTIONS

OPTION A

Fund 8 contacts

Lower cost; some gaps may remain.

OPTION B

Fund 12 contacts

More chances to complete the five-capability team.

OPTION C

Fund 18 contacts

Higher cost and stronger chance of full coverage.

KEY TERMS

Coupon collector

Duplicates

Waiting time

BEFORE YOU PLAY

1. Once four of the five capabilities are on the team, how likely is the next contact to fill the last gap?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why do the final capabilities take longer to find than the first ones?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Plan for the hardest remaining gap, rather than extrapolating from your early hiring pace." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 05 · THE OPENING

Hidden Connections

JUDGEMENT · COINCIDENCE

How quickly does a duplicate relationship become likely in a growing group?

THE SITUATION

Each new manager is assigned one of **365 independent onboarding dates**, uniformly at random. You are asked whether any two in the cohort share a date. Choose the cohort size you expect will create a match.

Target: Successful decisions

YOUR OPTIONS

OPTION A

12 managers

A relatively small cohort.

OPTION B

23 managers

A typical leadership programme.

OPTION C

40 managers

A larger gathering.

KEY TERMS

Birthday problem

Pairs

Complement

BEFORE YOU PLAY

1. How many different pairs of managers are there in a cohort of 23?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why does the number of pairs grow faster than the number of people?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Assess how many possible pairs exist before calling a coincidence suspicious." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 06 · THE OPENING

Competitor Intelligence

STRATEGY · INFERENCE

Estimate an unseen business from a handful of numbered assets.

THE SITUATION

A competitor numbers its sites consecutively from 1 to an unknown total. You will observe a random sample of **five different site IDs**. The true total is 100 in this simulation. Pick an estimator before the IDs arrive. An estimate within ± 15 of the true total counts as a success.

Target: Estimates within ± 15 · This is an estimation level: judge each method by its repeated results.

YOUR OPTIONS

OPTION A

Use the highest ID

Conservative estimate: observed maximum.

OPTION B

Scale the maximum

Estimate $N \approx (6/5) \times \text{maximum} - 1$.

KEY TERMS

Estimator

Bias

Sample maximum

BEFORE YOU PLAY

1. If the highest ID you see is 80, is the true total more likely to be above or below 80? Why?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Over many runs, how often did each estimator land within ± 15 ? Did either method win every time?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Ask how the sample was generated before treating its largest observed value as the full scale." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 07 · THE OPENING

The Appointment

PEOPLE · OPTIMAL STOPPING

Candidates arrive one at a time. Declining someone is final.

THE SITUATION

Eight candidates will be interviewed in a random order. You can compare each person with those already seen, but cannot recall anyone. Your goal is to appoint the **single strongest candidate**. Choose how many to observe first, then hire the next person who beats everyone seen; if none does, hire the last.

Target: Successful decisions

YOUR OPTIONS

OPTION A

Start immediately

Accept the first candidate: no benchmark.

OPTION B

Observe first 2

Build a small benchmark.

OPTION C

Observe first 3

Spend more interviews learning the field.

OPTION D

Observe first 5

Demand strong evidence, but risk running out of time.

KEY TERMS

Optimal stopping

Irreversible decision

Learning period

BEFORE YOU PLAY

1. What do you lose by hiring too early? What do you lose by waiting too long?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How did the success rate change as the observation period grew, and why does it not keep rising?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Set a learning period before an irreversible sequential decision." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 08 · THE OPENING

Product Experiments

INNOVATION · REPEATED TRIALS

How many independent pilots should you fund before the launch window closes?

THE SITUATION

Each product pilot independently has a **20% chance** of finding a viable concept. Every pilot costs \$10,000. The board values at least one viable concept; choose the number of pilots to commission.

Target: Successful decisions

YOUR OPTIONS

OPTION A

Fund 1 pilot

\$10k spend.

OPTION B

Fund 3 pilots

\$30k spend.

OPTION C

Fund 6 pilots

\$60k spend.

KEY TERMS

At least one

Complement

Diminishing returns

BEFORE YOU PLAY

1. If one pilot has a 20% chance, do five pilots give a 100% chance? Why or why not?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How much did each extra pilot add to the chance of at least one viable concept, and what did each one cost?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Budget experiments against the probability of finding at least one useful result, not an imagined guaranteed hit." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 09 · THE OPENING

Quality Audit

OPERATIONS · SAMPLING

Can a small audit catch a hidden defect without checking everything?

THE SITUATION

A shipment contains **30 units, exactly 4 defective**. Inspect units at random without replacement. Choose an audit size. A successful audit finds at least one defect before the shipment is released.

Target: Successful decisions

YOUR OPTIONS

OPTION A

Inspect 3 units

Fast but limited coverage.

OPTION B

Inspect 8 units

Moderate audit effort.

OPTION C

Inspect 15 units

Half the shipment.

KEY TERMS

Sampling without replacement

Hypergeometric

Complement

BEFORE YOU PLAY

1. After you inspect one good unit, what has happened to the mix of units that remain?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How did the shrinking pool change the chance of finding a defect on each further inspection?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Account for the changing pool when inspections cannot select the same item twice." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 10 · THE OPENING

The Budget Split

OPERATIONS · CONSTRAINTS

A fixed total can still produce an unusable allocation.

THE SITUATION

Three divisions need a share of a fixed \$1 million budget. A viable delivery plan requires **no division to receive at least half** the total, because the other two combined must outweigh each single allocation. Compare a random split with an intentional balanced split.

Target: Successful decisions

YOUR OPTIONS

OPTION A

Accept a random split

Choose two independent random cut points along the budget.

OPTION B

Set a balanced split

Allocate 30%, 33%, and 37%.

KEY TERMS

Geometric probability

Constraint

Random allocation

BEFORE YOU PLAY

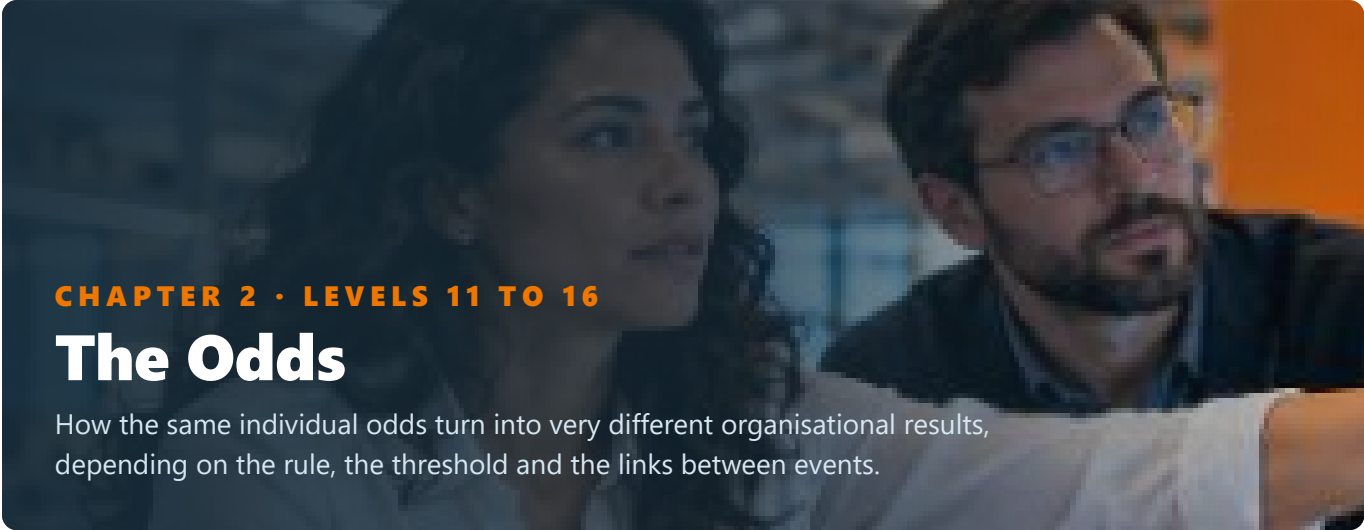
1. What has to be true of all three shares for a delivery plan to be viable?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why does a random split break the constraint so often?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Check structural constraints before judging allocations by averages alone." Describe a workplace or school situation where this would apply.

NOTES



CHAPTER 2 · LEVELS 11 TO 16

The Odds

How the same individual odds turn into very different organisational results, depending on the rule, the threshold and the links between events.

In this chapter you will play 6 levels. For each one, read the situation, answer the questions before you play, make a prediction, then play and test it.

LEVEL	TITLE	THEME	EXPLORED
11	Launch Gates	Strategy · reliability	☐
12	Sales Pipeline	Growth · conversion	☐
13	Incident Coverage	Operations · response	☐
14	Bid Window	Strategy · bids	☐
15	Training Cohort	People · capability	☐
16	Supplier Cover	Operations · resilience	☐



LEVEL 11 · THE ODDS

Launch Gates

STRATEGY · RELIABILITY

Serial, parallel, or majority sign-off: the same reviewers, three different chances of clearing a launch.

THE SITUATION

The board permits three different approval architectures. Each independent reviewer approves a sound launch with probability **80%**. Choose the governance design; the required passes differ.

Target: Launch cleared

YOUR OPTIONS

OPTION A

Two serial sign-offs

Both reviewers must approve.

OPTION B

Two alternative sign-offs

Either reviewer may approve.

OPTION C

Two of three reviewers

A majority is required.

KEY TERMS

Series and parallel

Majority vote

Reliability

BEFORE YOU PLAY

1. Which design needs every reviewer to approve, and which needs only one?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. With the same reviewers, why do the three designs clear the launch at such different rates?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Choose an approval architecture for its assurance requirements and reliability, not only the calibre of each reviewer." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 12 · THE ODDS

Sales Pipeline

GROWTH · CONVERSION

Big deals, mid-sized deals, or many small ones. Which portfolio most reliably clears a \$60k target?

THE SITUATION

The quarter needs at least **\$60k net contribution**. Three portfolios have different conversion rates, contract values, and pursuit costs. Choose before any lead responds.

Target: \$60k target met

YOUR OPTIONS

OPTION A

Two enterprise leads

Each wins with probability .35, contributes \$100k; pursuit costs \$20k.

OPTION B

Four mid-market leads

Each wins with probability .50, contributes \$40k; pursuit costs \$20k.

OPTION C

Eight smaller leads

Each wins with probability .70, contributes \$15k; pursuit costs \$30k.

KEY TERMS

Threshold

Expected value

Variance

BEFORE YOU PLAY

1. Why might the portfolio with the highest expected revenue not be the surest way to reach \$60k?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How did the spread of possible results affect the chance of clearing the fixed target?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Define the business threshold before comparing expected revenue and conversion rates." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 13 · THE ODDS

Incident Coverage

OPERATIONS · RESPONSE

A second team is only a real backup if it cannot fail for the same reason as the first.

THE SITUATION

An incident needs at least one team to respond. Each team can respond with probability **80%** when operating. A shared site outage occurs in 10% of weeks.

Target: Incident covered

YOUR OPTIONS

OPTION A

One team

Simple but no redundancy.

OPTION B

Two independent sites

One response is enough; outages are independent.

OPTION C

Two teams at one site

Both fail during the shared site outage.

KEY TERMS

Common-cause failure

Redundancy

Independent events

BEFORE YOU PLAY

1. If two teams share a site, what happens to both of them when the site goes down?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why does a second team add less protection when both depend on the same site?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Map common causes of failure before counting backup capacity as independent." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 14 · THE ODDS

Bid Window

STRATEGY · BIDS

Three offers arrive. You can accept an offer now or risk waiting for a better one.

THE SITUATION

Three independent offers, each an integer from 0 to 99, arrive in order. Rejecting is final. Choose a threshold: accept the first of the first two offers at or above it; otherwise accept the third. A contract worth **70 or more** meets the target.

Target: Offer ≥ 70 accepted

YOUR OPTIONS

OPTION A

Accept at 40

Early commitment.

OPTION B

Accept at 60

Moderate selectivity.

OPTION C

Accept at 80

Hold out for a premium offer.

KEY TERMS

Sequential decision

Threshold rule

Uniform distribution

BEFORE YOU PLAY

1. If you reject the first two offers, what are you left with?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How did each threshold trade a mediocre early offer against an unknown final offer?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Set acceptance rules before sequential offers arrive; the last chance changes the threshold tradeoff." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 15 · THE ODDS

Training Cohort

PEOPLE · CAPABILITY

Does a bigger panel make better calls? Only when each member is better than chance and thinks independently.

THE SITUATION

A panel of independently trained supervisors must classify a case correctly. Each member is right with probability **65%**. A strict majority decides.

Target: Panel correct

YOUR OPTIONS

OPTION A

Three-person panel

Two correct votes are needed.

OPTION B

Five-person panel

Three correct votes are needed.

OPTION C

Seven-person panel

Four correct votes are needed.

KEY TERMS

Majority vote

Independent events

Binomial

BEFORE YOU PLAY

1. If each supervisor is right 65% of the time, can a panel be right more often than any one member?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. What has to be true about the members for a larger panel to help?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Check independence and expertise before trusting a larger committee to be wiser." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 16 · THE ODDS

Supplier Cover

OPERATIONS · RESILIENCE

Three suppliers can look robust or fragile, depending on the promise you make to customers.

THE SITUATION

Three independently available suppliers each deliver with probability **75%**. Choose a service promise before placing the order. Different promises require different delivery counts.

Target: Service promise met

YOUR OPTIONS

OPTION A

One source is enough

Success if at least one delivers.

OPTION B

Two-source assurance

Success if at least two deliver.

OPTION C

Full three-source coverage

Success only if all three deliver.

KEY TERMS

Binomial

Service level

Redundancy

BEFORE YOU PLAY

1. How many deliveries does each service promise require?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why does the same supplier network look robust for one promise and fragile for another?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "State the service level first; redundancy is meaningful only relative to that requirement." Describe a workplace or school situation where this would apply.

NOTES

CHAPTER 3 · LEVELS 17 TO 24

The Search

Finding what matters: audits, inspections, pilots and outreach, where the way you search changes what you find.

In this chapter you will play 8 levels. For each one, read the situation, answer the questions before you play, make a prediction, then play and test it.

LEVEL	TITLE	THEME	EXPLORED
17	Recall Sample	Operations · quality	☐
18	Expense Review	Governance · audit	☐
19	Warehouse Check	Operations · inventory	☐
20	Contract Review	Governance · legal	☐
21	Market Signal	Growth · experimentation	☐
22	Recovery Attempts	Operations · reliability	☐
23	Partnership Outreach	Strategy · outreach	☐
24	Innovation Search	Innovation · discovery	☐



LEVEL 17 · THE SEARCH

Recall Sample

OPERATIONS · QUALITY

Finding one fault raises concern. Triggering a recall needs a second. How big must the sample be?

THE SITUATION

A batch has 40 devices, exactly 5 faulty. The recall trigger requires finding **at least two** faulty devices in a sample without replacement.

Target: Recall trigger reached

YOUR OPTIONS

OPTION A

Inspect 4 devices

Small initial sample.

OPTION B

Inspect 9 devices

Moderate sample.

OPTION C

Inspect 16 devices

Extensive sample.

KEY TERMS

Sampling without replacement

Hypergeometric

Evidence threshold

BEFORE YOU PLAY

1. How is finding two faulty devices different from finding one?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How much larger did the sample need to be to gather two pieces of evidence instead of one?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Set an evidence threshold before deciding an audit size." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 18 · THE SEARCH

Expense Review

GOVERNANCE · AUDIT

The observed sample changes the remaining pool; inspection is without replacement.

THE SITUATION

Among 50 claims, exactly 6 need escalation. The audit team can draw claims with replacement or set aside each claim after checking it. You get five or ten checks.

Target: Escalation found

YOUR OPTIONS

OPTION A

Five, with replacement

A claim could be checked twice.

OPTION B

Five, without replacement

Every check reaches a new claim.

OPTION C

Ten, without replacement

More effort, broader coverage.

KEY TERMS

Sampling with replacement

Sampling without replacement

Coverage

BEFORE YOU PLAY

1. If you draw with replacement, could you check the same claim twice? Would that help?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How much did setting claims aside help, compared with doubling the number of checks?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Ask whether a sampling process can revisit the same record." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 19 · THE SEARCH

Warehouse Check

OPERATIONS · INVENTORY

Rare exceptions can remain hidden after a reassuring small sample.

THE SITUATION

Sixty cartons form one line. Exactly three consecutive cartons are damaged; their starting position is uniformly random among 58 positions. Six inspections are available.

Target: Damage detected

YOUR OPTIONS

OPTION A

Six random cartons

Draw distinct cartons from the whole line.

OPTION B

Every tenth carton

Inspect positions 1, 11, 21, 31, 41, 51.

OPTION C

First six cartons

Inspect positions 1 through 6.

KEY TERMS

Clustered failure

Systematic sampling

Spacing

BEFORE YOU PLAY

1. The damaged cartons sit next to each other. Does that make spreading your checks out more or less useful?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why did the placement of the inspections matter as much as their number?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Match inspection placement to how failures are distributed." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 20 · THE SEARCH

Contract Review

GOVERNANCE · LEGAL

Sampling more agreements increases the chance of detecting an escalation.

THE SITUATION

Of 25 agreements, four require escalation. A risk score places three of those four in an eight-agreement high-risk pool. Choose where to spend four reviews.

Target: Escalation found

YOUR OPTIONS

OPTION A

Four random agreements

Sample from all 25.

OPTION B

Four high-risk agreements

Sample without replacement from the flagged eight.

OPTION C

Four low-risk agreements

Sample from the other 17.

KEY TERMS

Risk score

Targeting

Base rate

BEFORE YOU PLAY

1. How many of the four escalations sit in the high-risk pool, and how large is that pool?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. What made targeted review efficient here, and what would make it worse?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Validate the quality of a risk score before targeting an audit." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 21 · THE SEARCH

Market Signal

GROWTH · EXPERIMENTATION

Two pilot interviews can guide which of two markets deserves the launch.

THE SITUATION

One market has a 60% favourable response rate and the other 20%, but you do not know which. Both assignments are equally likely. You observe two independent pilot interviews in Market A, then choose where to launch. A favourable response to the launch is the target.

Target: Favourable launch response

YOUR OPTIONS

OPTION A

Launch in A regardless

Ignore the pilot.

OPTION B

Launch in B regardless

Ignore the pilot.

OPTION C

Use the pilot

Choose A after at least one favourable pilot response; otherwise B.

KEY TERMS

Conditional probability

Prior

Updating

BEFORE YOU PLAY

1. Before any pilot, what is your chance of a favourable launch response in either market?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How much did two interviews improve the launch choice, and why were they not decisive?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Update a decision after informative evidence while remembering that two observations remain noisy." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 22 · THE SEARCH

Recovery Attempts

OPERATIONS · RELIABILITY

Trying the same fix again is not the same as improving the fix.

THE SITUATION

The first recovery attempt works 35% of the time. After a failure, you may repeat unchanged, retrain the team to 65% success, or call in a specialist with 50% success. The window allows four attempts for the first two options and three for the specialist.

Target: Service recovered

YOUR OPTIONS

OPTION A

Repeat unchanged

Four attempts at 35% each.

OPTION B

Retrain after failure

First attempt 35%, then three at 65%.

OPTION C

Call a specialist

Three attempts at 50%.

KEY TERMS

Learning

Repeated trials

Conditional probability

BEFORE YOU PLAY

1. If an attempt has failed once, is the same attempt any more likely to work next time?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why can fewer, better attempts beat more attempts of the same kind?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Distinguish an improved process from simply trying the same failed action again." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 23 · THE SEARCH

Partnership Outreach

STRATEGY · OUTREACH

Repeated outreach builds opportunity without creating a guarantee.

THE SITUATION

You can make a short sequence of partner approaches. Broad outreach has a steady response rate; tailored outreach starts stronger but falls as the best prospects are contacted.

Target: Meeting secured

YOUR OPTIONS

OPTION A

Three broad approaches

Three independent 25% chances.

OPTION B

Tailored sequence

Three chances: 40%, then 30%, then 20%.

OPTION C

Two warm introductions

Two independent 45% chances.

KEY TERMS

Declining success rate

Sequencing

Average

BEFORE YOU PLAY

1. If the best prospects are contacted first, what happens to the chance of each later approach?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why can a single average response rate mislead an outreach forecast?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Forecast outreach using the quality of each next prospect, not a single average rate." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 24 · THE SEARCH

Innovation Search

INNOVATION · DISCOVERY

A single pilot can tell you whether to stay on an uncertain track or switch to a steady one.

THE SITUATION

One research track is either promising or poor, each with prior probability 50%. In a promising state each prototype works 70% of the time; in a poor state 10%. A second track succeeds steadily at 40%. Fund four prototypes and aim for at least two successes.

Target: Two viable prototypes

YOUR OPTIONS

OPTION A

Stay on the uncertain track

All four prototypes use the same hidden track state.

OPTION B

Use the steady track

Four independent 40% prototypes.

OPTION C

Pilot then adapt

Try uncertain once; after a success stay, after a failure switch to steady.

KEY TERMS

Prior

Bayes' rule

Adaptive allocation

BEFORE YOU PLAY

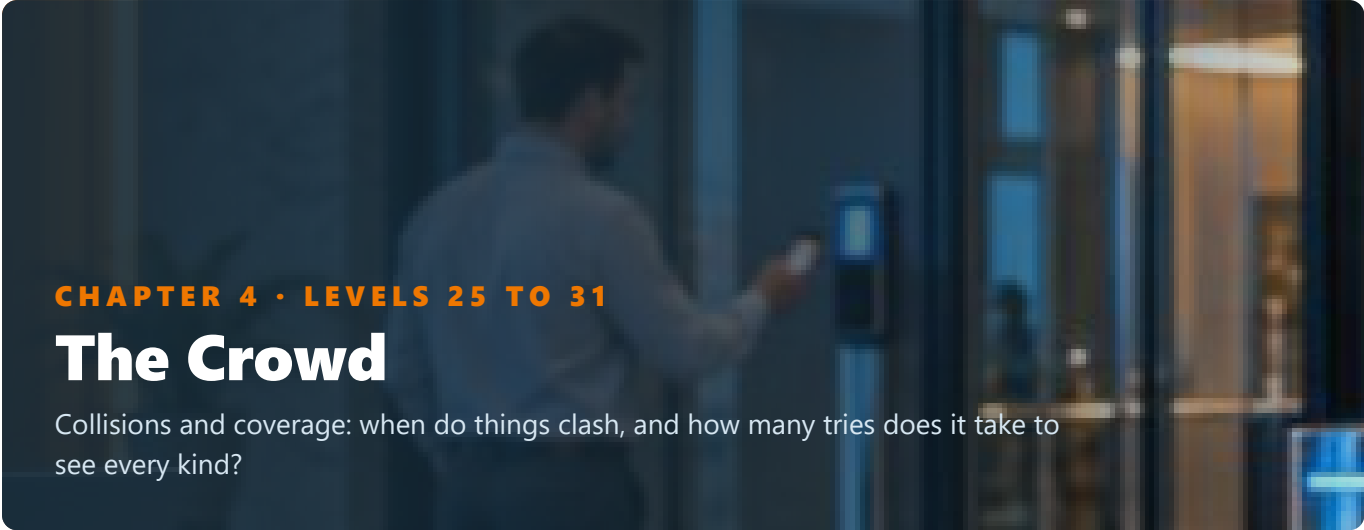
1. What would one successful prototype tell you about the uncertain track?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How did adapting after the pilot compare with committing in advance?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Treat a pilot as evidence that informs the next allocation, not just an isolated win or loss." Describe a workplace or school situation where this would apply.

NOTES



CHAPTER 4 · LEVELS 25 TO 31

The Crowd

Collisions and coverage: when do things clash, and how many tries does it take to see every kind?

In this chapter you will play 7 levels. For each one, read the situation, answer the questions before you play, make a prediction, then play and test it.

LEVEL	TITLE	THEME	EXPLORED
25	Access Code Clash	Risk · collision	☐
26	Shift Pattern Overlap	People · coordination	☐
27	Campaign Slot Clash	Marketing · scheduling	☐
28	Regional Footprint	Strategy · expansion	☐
29	Skill Matrix	People · staffing	☐
30	Customer Voices	Research · representation	☐
31	Service Portfolio	Operations · coverage	☐



LEVEL 25 · THE CROWD

Access Code Clash

RISK · COLLISION

Code collisions become plausible well before all codes are used.

THE SITUATION

Twenty managers need codes from a pool of 100. Compare a reusable random generator, a central no-reuse registry, and two regional registries that each prevent local repeats but do not coordinate with each other. The target is **no duplicated code**.

Target: No duplicate codes

YOUR OPTIONS

OPTION A

Reusable random codes

All 20 draws are independent; duplicates possible anywhere.

OPTION B

Central no-reuse registry

Draw 20 distinct codes.

OPTION C

Two regional registries

Each region draws 10 distinct codes; cross-region overlap is possible.

KEY TERMS

Collision

Coordination

Sampling without replacement

BEFORE YOU PLAY

1. Which of the three designs could ever issue the same code twice?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why can two registries that each prevent repeats still produce a clash?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Coordinate identifiers across organisational boundaries, not only inside each team." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 26 · THE CROWD

Shift Pattern Overlap

PEOPLE · COORDINATION

How likely is one newcomer to share a shift pattern with someone already on the team?

THE SITUATION

One incoming project lead has a fixed shift pattern. Existing leads independently have one of 28 equally likely patterns. What is the chance the newcomer matches **at least one** existing lead?

Target: Newcomer has a match

YOUR OPTIONS

OPTION A

Compare with 5 leads

A small existing team.

OPTION B

Compare with 8 leads

A medium team.

OPTION C

Compare with 12 leads

A large team.

KEY TERMS

Specific match

Complement

Birthday problem

BEFORE YOU PLAY

1. How is this question different from asking whether any two leads share a pattern? (Compare level 5.)
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why does matching one particular newcomer need many more people than finding any pair?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Distinguish a particular person's collision risk from the chance that any pair collides." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 27 · THE CROWD

Campaign Slot Clash

MARKETING · SCHEDULING

One clash in your launch week is manageable. Two or more is a crowd.

THE SITUATION

A campaign is booked for one particular week. Other teams independently select one of 52 weeks. Two or more teams in your week create a serious clash. The target is **at most one** other team in your week.

Target: At most one clash

YOUR OPTIONS

OPTION A

6 other teams

A small calendar.

OPTION B

10 other teams

A busy calendar.

OPTION C

15 other teams

A crowded calendar.

KEY TERMS

Specific collision

Binomial

Rare events

BEFORE YOU PLAY

1. Does it matter if other teams clash with each other, or only if they clash with your week?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why is a serious clash with your week so much rarer than a clash somewhere in the calendar?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Specify which collision matters before interpreting calendar-wide coincidence rates." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 28 · THE CROWD

Regional Footprint

STRATEGY · EXPANSION

The final uncovered region dominates the waiting time.

THE SITUATION

You need activity in each of four regions. Eight opportunities are available. Compare passive random discovery, deliberately filling missing regions, and spending four contacts in one priority region.

Target: All regions active

YOUR OPTIONS

OPTION A

Eight random opportunities

Each independently falls in one of four regions.

OPTION B

Adaptive coverage

Four random opportunities, then directly target any missing regions.

OPTION C

Priority-region focus

Four guaranteed in one region; four random across the other three.

KEY TERMS

Coverage

Adaptive strategy

Coupon collector

BEFORE YOU PLAY

1. With eight random opportunities, what could stop you covering all four regions?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why could one approach guarantee coverage when random volume could not?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Switch from discovery to targeted gap-closing once you know what is missing." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 29 · THE CROWD

Skill Matrix

PEOPLE · STAFFING

Duplicates do not close the last capability gap.

THE SITUATION

Six specialisms appear with unequal frequencies: **35%, 25%, 20%, 10%, 7%, 3%**. Every contact has one primary specialism. Can you complete the matrix?

Target: All six covered

YOUR OPTIONS

OPTION A

9 contacts

Small search.

OPTION B

14 contacts

Moderate search.

OPTION C

20 contacts

Extended search.

KEY TERMS

Unequal probabilities

Coupon collector

Rare category

BEFORE YOU PLAY

1. Which specialism do you expect to be found last, and why?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How strongly did the rarest specialism drive the number of contacts needed?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Forecast the hardest capability from its actual frequency rather than assuming all skills are equally common." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 30 · THE CROWD

Customer Voices

RESEARCH · REPRESENTATION

A large interview count can still omit one segment entirely.

THE SITUATION

You need voices from five customer segments. A random incoming caller belongs to each segment with equal probability. Compare unstructured recruitment with a quota method that deliberately books one from every segment.

Target: Every segment heard

YOUR OPTIONS

OPTION A

Five random calls

No segment control.

OPTION B

Ten random calls

More volume, still no guarantee.

OPTION C

Five quota bookings

One confirmed respondent in each segment.

KEY TERMS

Quota sampling

Representation

Coverage

BEFORE YOU PLAY

1. Could ten random calls still miss a segment completely?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why can a deliberate method guarantee something that random volume cannot?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "When representation is a requirement, recruit by segment instead of hoping random intake covers it." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 31 · THE CROWD

Service Portfolio

OPERATIONS · COVERAGE

Completion depends on coverage across categories, not only ticket volume.

THE SITUATION

Tickets independently exercise one of three service types. The release gate needs **at least two different types** exercised before sign-off.

Target: At least two types

YOUR OPTIONS

OPTION A

Run 3 tickets

Fast smoke test.

OPTION B

Run 5 tickets

Moderate coverage.

OPTION C

Run 8 tickets

Extended coverage.

KEY TERMS

At least two kinds

Complement

Test coverage

BEFORE YOU PLAY

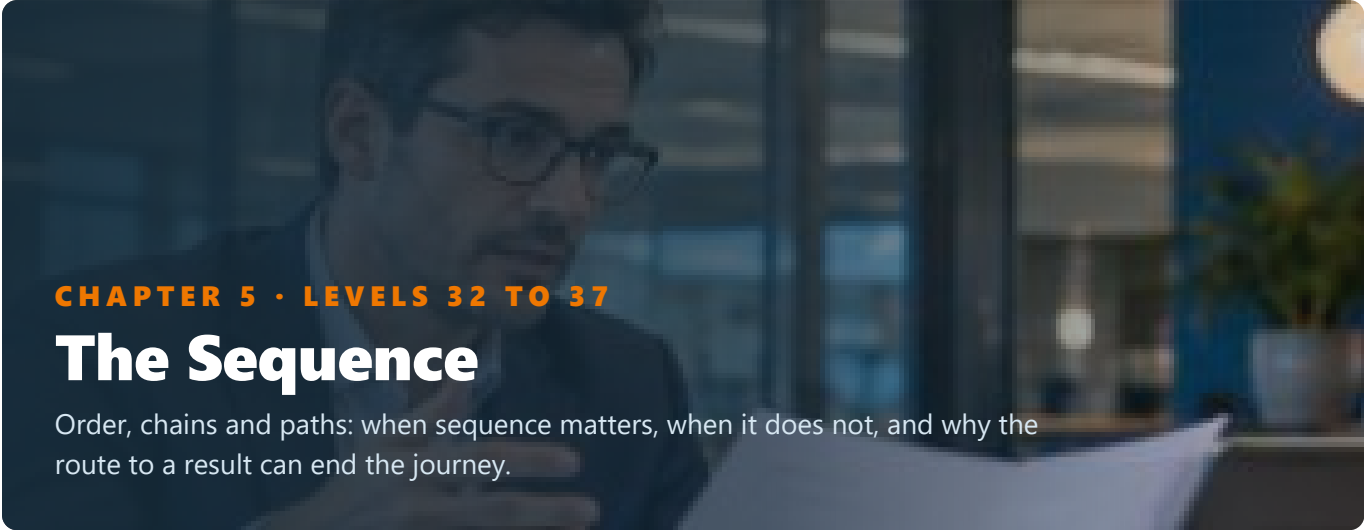
1. What is the only way the release gate can fail?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How quickly did the chance that every ticket is the same type shrink as you ran more tickets?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Track diversity of exercised cases, not just the total test count." Describe a workplace or school situation where this would apply.

NOTES



CHAPTER 5 · LEVELS 32 TO 37

The Sequence

Order, chains and paths: when sequence matters, when it does not, and why the route to a result can end the journey.

In this chapter you will play 6 levels. For each one, read the situation, answer the questions before you play, make a prediction, then play and test it.

LEVEL	TITLE	THEME	EXPLORED
32	Approval Chain	Strategy · sequencing	☐
33	Handover Relay	Operations · coordination	☐
34	Board Endorsement	Governance · sequencing	☐
35	Project Float	Operations · schedule	☐
36	Cash Buffer	Finance · survival	☐
37	Service Credits	Operations · risk	☐



LEVEL 32 · THE SEQUENCE

Approval Chain

STRATEGY · SEQUENCING

When any two approvals will do, does the meeting order still matter?

THE SITUATION

The project now needs **any two approvals** out of three; adjacency does not matter. Two high-reliability reviewers approve with probability 75% and one difficult reviewer with probability 35%. Choose the order.

Target: Any two approvals

YOUR OPTIONS

OPTION A

High → High → Difficult

Easy meetings first.

OPTION B

Difficult → High → High

Difficult meeting first.

KEY TERMS

Order independence

Independent events

Two of three

BEFORE YOU PLAY

1. Does the order of the meetings matter if the approvals no longer need to be adjacent?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How did the two orders compare after 1,000 runs, and why?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Ask whether a process truly depends on order before spending effort optimising a sequence." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 33 · THE SEQUENCE

Handover Relay

OPERATIONS · COORDINATION

Every handover must work. Where does a backup crew earn its place?

THE SITUATION

A delivery has three required handovers, each working with probability **80%**. Add independent backup crews at the middle stage or at every stage.

Target: Delivery completed

YOUR OPTIONS

OPTION A

Single crew per stage

All three must work.

OPTION B

Backup at the middle

Either middle crew can succeed.

OPTION C

Backups at every stage

Two alternatives for each of three stages.

KEY TERMS

Series reliability

Redundancy

Weakest link

BEFORE YOU PLAY

1. If any one handover fails, what happens to the whole delivery?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why does a backup protect only the stage where it is installed?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Place redundancy on required links, especially where failure would halt the entire chain." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 34 · THE SEQUENCE

Board Endorsement

GOVERNANCE · SEQUENCING

Same three voters, different rules. The rule can matter more than the people.

THE SITUATION

A board has three independent voters. Ordinary members support a sound proposal 70% of the time; the chair does so 80%. Compare voting rules, not meeting order.

Target: Proposal approved

YOUR OPTIONS

OPTION A

Unanimous three

All ordinary members must approve.

OPTION B

Majority of three

At least two ordinary members approve.

OPTION C

Chair plus one

Chair approves and at least one of two ordinary members approves.

KEY TERMS

Voting rule

Majority vote

Independent events

BEFORE YOU PLAY

1. Which rule requires the chair's support, and which requires everyone's?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. With the same three people, why did the rules give different chances of approval?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Make the decision rule explicit before comparing the composition or order of a committee." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 35 · THE SEQUENCE

Project Float

OPERATIONS · SCHEDULE

Six reserve units, two ways to fail. How should you split the buffer between schedule and budget?

THE SITUATION

The project has a total of six reserve units to divide between **schedule float** and **budget headroom**. Over six reviews, schedule gains one unit with probability 45% and budget gains one with probability 60%; otherwise each loses one. Either reserve hitting zero ends the project.

Target: Both reserves survive

YOUR OPTIONS

OPTION A

Four schedule, two budget

Protect the weaker schedule process.

OPTION B

Three and three

Balanced reserves.

OPTION C

Two schedule, four budget

Protect budget more heavily.

KEY TERMS

Random walk

Two failure modes

Allocation

BEFORE YOU PLAY

1. The two reserves move differently over the six reviews. How would you decide how much each one needs?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why might an even split not be the safest allocation?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Allocate a finite reserve across failure modes according to their risk, not simply half and half." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 36 · THE SEQUENCE

Cash Buffer

FINANCE · SURVIVAL

Small safe steps or big bold bets? The stake size changes the odds of reaching the goal before ruin.

THE SITUATION

Cash starts at four units. Reach seven before zero. Choose the size and chance of each independent bet; a gain or loss moves the reserve by the selected step. Crossing a boundary ends play.

Target: Funding before ruin

YOUR OPTIONS

OPTION A

Cautious steps

Gain or lose 1; gain chance 55%.

OPTION B

Bold steps

Gain or lose 3; gain chance 45%.

OPTION C

Medium steps

Gain or lose 2; gain chance 50%.

KEY TERMS

Risk of ruin

Bet size

Absorbing boundary

BEFORE YOU PLAY

1. What does each step size mean for how quickly you could reach seven, or zero?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why is the win rate alone not enough to compare these strategies?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Match bet size to the distance from both success and insolvency." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 37 · THE SEQUENCE

Service Credits

OPERATIONS · RISK

A good average month can still hit zero along the way. How much reserve do you need?

THE SITUATION

Six incidents remain this month. Each independently restores one service credit with probability **55%** or consumes one otherwise. Falling to zero at any point fails the service commitment, even if later incidents might have helped.

Target: Survived the month

YOUR OPTIONS

OPTION A

Start with 2 credits

Lean reserve.

OPTION B

Start with 3 credits

Moderate reserve.

OPTION C

Start with 4 credits

Larger reserve.

KEY TERMS

Path dependence

Random walk

Absorbing boundary

BEFORE YOU PLAY

1. Could you fail the commitment even if you end the month with more credits than you started with?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why does the path through the month matter, not only the final balance?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Model interim failure boundaries, not only the expected final balance." Describe a workplace or school situation where this would apply.

NOTES



CHAPTER 6 · LEVELS 38 TO 46

The Signal

Evidence and inference: alerts, adversaries, geometry, waiting times, estimates from overlap and random rotations.

In this chapter you will play 9 levels. For each one, read the situation, answer the questions before you play, make a prediction, then play and test it.

LEVEL	TITLE	THEME	EXPLORED
38	Fraud Alert	Governance · detection	☐
39	Adversarial Audit	Operations · screening	☐
40	Sensor Placement	Risk · screening	☐
41	Fleet Dispatch	Strategy · intelligence	☐
42	Branch Census	Strategy · inference	☐
43	Rotating Reviewers	Governance · allocation	☐
44	Client Reassignment	Sales · allocation	☐
45	Mentor Rotation	People · development	☐
46	Stream Balance	People · allocation	☐



LEVEL 38 · THE SIGNAL

Fraud Alert

GOVERNANCE · DETECTION

A test that is right 95% of the time can still raise mostly false alarms when fraud is rare.

THE SITUATION

Two percent of claims are fraudulent. An independent test catches 90% of fraud and clears 95% of honest claims.

Target: Correct decisions

YOUR OPTIONS

OPTION A

Act on one positive

Fast response, more false alarms.

OPTION B

Require two positive tests

Fewer false alarms, more missed cases.

OPTION C

Take no action

No testing cost, all real cases missed.

KEY TERMS

Base rate

False positive

Conditional probability

BEFORE YOU PLAY

1. Out of 1,000 claims, roughly how many are fraudulent, and how many honest claims might the test flag?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why can false alarms outnumber real fraud among the positive alerts?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Test policy should reflect the prevalence and the different costs of misses and false alarms." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 39 · THE SIGNAL

Adversarial Audit

OPERATIONS · SCREENING

A supplier knows where you will inspect. Can they hide a defective unit?

THE SITUATION

One defective unit is hidden among 12. The supplier learns your inspection policy before choosing the hiding place. You may inspect three units. A random policy draws a new sample each round; fixed policies reveal their positions.

Target: Defect detected

YOUR OPTIONS

OPTION A

Random three

Choose three of twelve uniformly after the unit is hidden.

OPTION B

First three

Always inspect positions 1–3.

OPTION C

Last three

Always inspect positions 10–12.

KEY TERMS

Adversary

Randomised strategy

Game theory

BEFORE YOU PLAY

1. If the supplier knows exactly which units you will check, where will they hide the defect?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why does a random policy protect you when a fixed one does not?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "When another party adapts to your checks, treat the inspection policy as part of the game." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 40 · THE SIGNAL

Sensor Placement

RISK · SCREENING

How often will a random safety marker land entirely within its inspection zone?

THE SITUATION

A circular marker of radius **0.15 units** lands with its centre uniformly in a square inspection zone of side L . It counts only if the whole marker lies inside. Choose the zone size.

Target: Marker fully contained

YOUR OPTIONS

OPTION A

Compact zone · $L=0.6$

Small footprint.

OPTION B

Standard zone · $L=0.8$

Moderate footprint.

OPTION C

Wide zone · $L=1.0$

Larger footprint.

KEY TERMS

Geometric probability

Clearance

Area

BEFORE YOU PLAY

1. Where can the centre of the marker land if the whole marker must stay inside the zone?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why does a small zone lose such a large share of its area to the clearance margin?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Account for clearance around an object, not just whether its centre lies inside a boundary." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 41 · THE SIGNAL

Fleet Dispatch

STRATEGY · INTELLIGENCE

Equal-frequency services can deliver very unequal journeys.

THE SITUATION

An express bus arrives at minute 0 of every hour. A local bus also arrives hourly, at a fixed offset. You arrive uniformly at a random minute and board whichever comes next. The goal is the express service.

Target: Express boarded

YOUR OPTIONS

OPTION A

Local at minute 5

Long gap from local to next express.

OPTION B

Local at minute 30

Evenly spaced arrivals.

OPTION C

Local at minute 55

Short gap from local to next express.

KEY TERMS

Waiting time

Interval length

Uniform distribution

BEFORE YOU PLAY

1. Both buses run once an hour. Why might you not board each of them half of the time?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How did the gap before each bus decide your boarding share?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Measure exposure time between events before inferring outcomes from equal headline frequency." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 42 · THE SIGNAL

Branch Census

STRATEGY · INFERENCE

Estimate an unseen network using overlap between two surveys.

THE SITUATION

A competitor has **80 branches**. A directory identifies 20. Your second random survey samples different branches; the number also seen in the directory is the overlap. Estimate the total by $20 \times \text{sample size} / \text{overlap}$ (or 200 when overlap is zero).

Target: Estimate within $\pm 20\%$

YOUR OPTIONS

OPTION A

Survey 7 branches

Low field effort.

OPTION B

Survey 10 branches

Moderate effort.

OPTION C

Survey 20 branches

Larger sample.

KEY TERMS

Capture–recapture

Estimator

Overlap

BEFORE YOU PLAY

1. If your survey finds many branches already in the directory, what does that suggest about the total?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why does a larger second survey tend to give a steadier estimate?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: “Use independent overlapping samples to infer scale when serial numbers are unavailable.” Describe a workplace or school situation where this would apply.

NOTES



LEVEL 43 · THE SIGNAL

Rotating Reviewers

GOVERNANCE · ALLOCATION

Shuffle reviewers at random. Does anyone end up with the same case as last time?

THE SITUATION

Randomly assign reviewers to cases. No reviewer should receive the same case as last cycle.

Target: No original matches

YOUR OPTIONS

OPTION A

Reassign 3 items

Every assignment is a random permutation.

OPTION B

Reassign 5 items

Every assignment is a random permutation.

OPTION C

Reassign 8 items

Every assignment is a random permutation.

KEY TERMS

Derangement

Random permutation

Fixed point

BEFORE YOU PLAY

1. If you shuffle the items at random, how likely is it that none stays where it was? Guess before you play.
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How did the chance of no old match change as the group grew? Did it keep moving?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Random reassignment does not guarantee separation from the previous arrangement." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 44 · THE SIGNAL

Client Reassignment

SALES · ALLOCATION

You want exactly one client to keep their manager. How often does a random rotation deliver that?

THE SITUATION

Randomly reassign client accounts. This time you want **exactly one** client to keep their previous manager, preserving one anchor relationship while changing all others.

Target: Exactly one retained

YOUR OPTIONS

OPTION A

Rotate 4 accounts

A small portfolio.

OPTION B

Rotate 7 accounts

A mid-sized portfolio.

OPTION C

Rotate 10 accounts

A broad portfolio.

KEY TERMS

Derangement

Fixed point

Random permutation

BEFORE YOU PLAY

1. How is “exactly one client keeps their manager” different from “no client does”? (Compare level 43.)
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why did the results look so similar across the larger groups?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: “Specify the exact amount of continuity you want from a rotation.” Describe a workplace or school situation where this would apply.

NOTES



LEVEL 45 · THE SIGNAL

Mentor Rotation

PEOPLE · DEVELOPMENT

A rotation can avoid every old pairing and still create two-way mentor swaps.

THE SITUATION

Randomly rotate mentors among teams. The risk is a **reciprocal swap**: team A gets B's mentor and team B gets A's. Choose the size of the rotation and look for any two-cycle.

Target: No reciprocal swaps

YOUR OPTIONS

OPTION A

Rotate 3 teams

Small circle.

OPTION B

Rotate 6 teams

Medium circle.

OPTION C

Rotate 10 teams

Large circle.

KEY TERMS

Two-cycle

Random permutation

Specific pattern

BEFORE YOU PLAY

1. What has to happen for a reciprocal swap to appear?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. How is avoiding swaps different from avoiding old pairings? (Compare level 43.)
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "State which relationships a random rotation is meant to break." Describe a workplace or school situation where this would apply.

NOTES



LEVEL 46 · THE SIGNAL

Stream Balance

PEOPLE · ALLOCATION

Assign auditors at random to two streams. How often is the split exactly even?

THE SITUATION

Auditors are assigned independently to one of two review streams. The assignment is balanced only when **exactly half** join each stream.

Target: Perfectly balanced split

YOUR OPTIONS

OPTION A

Allocate 4 auditors

Need a 2–2 split.

OPTION B

Allocate 6 auditors

Need a 3–3 split.

OPTION C

Allocate 10 auditors

Need a 5–5 split.

KEY TERMS

Binomial

Exact outcome

Deliberate allocation

BEFORE YOU PLAY

1. With more auditors, do you expect an exactly even split to be more or less likely?
2. Put the target in your own words. What exactly has to happen for a round to count as a success?
3. Which assumption in the brief matters most (for example, independence or equally likely outcomes)? Is it realistic?

My prediction: option _____

AFTER YOU PLAY

1. Why does the chance of an exact split fall even though results cluster near half?
2. Run 1,000 simulations for every option. How did the rates compare with your prediction, and with your single round?
3. The takeaway was: "Use deliberate allocation when an exact staffing balance matters." Describe a workplace or school situation where this would apply.

NOTES

Closing reflection

Pick three levels from at least two different chapters and use them to answer the questions below.

1. Describe a time in the game when you chose an approach with a lower success chance and still met the target. What did that round tell you, and what did it not tell you?
2. Choose one level where your first prediction was wrong. What was your reasoning, and what changed your mind: the batch of 1,000 runs, the intuitive proof or the mathematical proof?
3. Find two levels that tell a similar story but rest on different mathematics (for example level 1 and level 32). Explain the difference in your own words.
4. Pick one level where the option with the highest success chance might not be the best management decision. What else would you weigh, and why?
5. Choose one assumption from a brief (such as independence, or equally likely options). Describe a real situation where it would fail, and how that might change the decision.
6. Write a short note to a new manager: one piece of advice about decisions under uncertainty, with an example from the game.

YOUR REFLECTION

Keep playing

- ☐ Replay a level and run 1,000 simulations for every option.
- ☐ Open both proofs on a level you found surprising.
- ☐ Try a chapter you have not played yet.
- ☐ Explain one level to someone else without using the word “luck”.

Glossary

Absorbing boundary

A level that ends the process once it is reached, such as running out of cash or reaching a funding target.

Adaptive allocation

Deciding where to put the next resource after seeing earlier results.

Adversary

Another party who chooses their action knowing, or guessing, your policy.

At least one

An event that happens once or more. Often easiest to find as 1 minus the chance of none.

Base rate

How common something is before any test or evidence, also called prevalence.

Bayes' rule

A way to update the probability of a hidden state after seeing evidence.

Bias (of an estimator)

A tendency to land too high or too low on average.

Binomial

The count of successes in a fixed number of independent tries with the same chance each time.

Birthday problem

The surprising chance that some pair in a group shares a value, because the number of pairs grows quickly.

Capture–recapture

Estimating the size of a group from how much two independent samples overlap.

Collision

Two items receiving the same value, such as the same code, date or week.

Common-cause failure

One event that knocks out several supposedly separate backups at once.

Complement

Everything except the event. $P(\text{not } A) = 1 - P(A)$.

Conditional probability

The chance of one event given that another has happened.

Coupon collector

How many random draws it takes to see every type at least once.

Derangement

An arrangement in which nothing stays in its original place.

Diminishing returns

Each extra unit of effort adds less than the one before.

Dominant strategy

A choice that is better for you whatever the other side does.

Estimator

A rule that turns sample data into a guess about an unknown quantity.

Expected value

The long-run average result: each outcome's value times its probability, added together.

False positive

A test flags something that is not really there.

Fixed point

An item that stays in the same place after a rearrangement.

Geometric probability

Probability measured by length, area or volume when a point lands at random.

Hypergeometric

Counts from sampling without replacement from a finite group with a known mix.

Inclusion–exclusion

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, so overlap is not counted twice.

Independent events

Events where knowing one happened does not change the chance of the other.

Law of large numbers

Over many trials the observed rate settles near the true probability.

Majority vote

A rule where a decision passes if more than half agree.

Optimal stopping

Choosing when to stop looking and commit, when you cannot go back.

Path dependence

The route matters, not just the end point; one dip can end the process.

Prior

Your probability for a hidden state before you see new evidence.

Probability

A number from 0 to 1 (0% to 100%) describing how often an event happens in the long run.

Quota sampling

Deliberately recruiting a set number from each group.

Random permutation

A shuffle in which every ordering is equally likely.

Random walk

A quantity that moves up or down by chance at each step.

Redundancy

Extra capacity that can take over when something fails.

Risk of ruin

The chance of hitting a failure boundary before reaching the goal.

Sampling with replacement

Each item is returned after checking, so it can be picked again.

Sampling without replacement

Each checked item is set aside, so the remaining pool changes.

Series and parallel

Series: every link must work. Parallel: any one working link is enough.

Simulation

Running a random model many times to see the pattern of results.

Variance

How widely results spread around their average.