

TableForge — Flashcards

A Spark & Anvil printable flashcard deck. Quiz yourself on the TableForge cast's curriculum — one card at a time.

How to use these cards

Fold each sheet down the middle line so the answers are hidden. Read the **question** on the left, say your answer out loud, then **unfold** to check the right side. Testing yourself — then checking — is one of the most powerful ways to remember. Get one wrong? That's the best kind of practice: try it again tomorrow.

Want real flashcards? Cut along the fold line and the rows into cards — question on one side, answer on the other.

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How to use these cards

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1. Dice Probability

⌂ Question (fold →)	Answer
A game gives bonus coins when you roll doubles (both dice the same). What's the probability of rolling doubles with 2 dice?	6 out of 36 (or 1/6) — Doubles are (1,1), (2,2), (3,3), (4,4), (5,5), (6,6) — six outcomes out of 36 total, giving probability $6/36 = 1/6$.
What does 'expected value' mean in a dice game?	The average outcome you would expect over many rolls — Expected value is the long-run average outcome: it tells you what to expect on average over many trials, even though any single roll may differ.
A player must roll a 5 or higher to succeed on an attack. What is the probability of success on one d6 roll?	2 out of 6 (or 1/3) — Rolling 5 or 6 are the two favorable outcomes out of 6 total faces, giving probability $2/6 = 1/3$ (about 33%).
Which design choice would make a dice game MORE random?	Use one d20 instead of two d6 — A single d20 has 20 equally likely outcomes (high variance, uniform). 2d6 has a bell curve clustered around 7 (less random feel). The d20 is 'more random'.
What is the probability of rolling an EVEN number on a standard die?	3 out of 6 (or 1/2) — There are three even faces (2, 4, 6) out of six, giving probability $3/6 = 1/2$ or 50%.
How many total outcomes are possible when rolling two 6-sided dice?	36 — Each die has 6 outcomes independently, so two dice produce $6 \times 6 = 36$ ordered outcomes.
Probability is usually expressed as a number between which two values?	0 and 1 — Probabilities range from 0 (impossible) to 1 (certain). Values can also be expressed as percentages from 0% to 100%.
A game uses 'roll-and-move' with one d6. A player needs to land EXACTLY on space 30, currently on space 27. What's the probability of an exact landing?	1 out of 6 — To move from 27 to exactly 30, the player needs to roll exactly 3, which has probability $1/6$ on a standard die.
Why might a game designer choose to use a 'd4' (4-sided die) instead of a 'd6'?	To narrow the range of outcomes and reduce variance — A d4 produces 1-4 instead of 1-6, narrowing the range so results are more predictable. Designers pick die sizes to tune randomness vs. predictability.
What is the SUM of probabilities for all possible outcomes on a fair die?	1 (or 100%) — The probabilities of all possible outcomes must sum to 1 because something must happen. Six faces at $1/6$ each gives $6/6 = 1$.
If a player rolls a 20-sided die (d20), what is the probability of rolling exactly 15?	1 out of 20 — A d20 has 20 faces numbered 1-20. Each face has probability $1/20$, so rolling exactly 15 is $1/20$.
Why is rolling two dice and adding them DIFFERENT from rolling one die twice as fast?	Two dice produce a bell-curve of sums, while one die produces equally likely outcomes — Two-dice sums favor the middle (7 is most common); a single die has uniform probability for every face. The shape of the distribution differs completely.
What is the probability of rolling a 4 on a fair 6-sided die?	1 out of 6 — There is exactly one face with a 4, and six faces total, so the probability is $1/6$.
When you roll a standard 6-sided die	6 — A standard 6-sided die has six faces numbered 1-6, so a single roll

once, how many possible outcomes are there?	has 6 equally likely outcomes.
A 'fair' die means:	Every face has an equal chance of landing up — A fair die is one where each face has the same probability (1/6) of facing up — the die is not weighted or biased.
In a game where players earn points equal to their die roll, what is the expected score per turn?	3.5 points — Average score per turn equals the expected value of the die: $(1+2+3+4+5+6)/6 = 3.5$ points.
If you roll a die 60 times, about how many times would you expect to roll a 3?	About 10 times — Each roll has 1/6 chance of being a 3. Over 60 rolls, you would expect $60 \times (1/6) = 10$ threes on average.
If your game piece moves the number rolled on a single die, what is the average (expected) number of spaces per turn?	3.5 — The expected value is the mean of all face values: $(1+2+3+4+5+6)/6 = 21/6 = 3.5$ spaces per turn on average.
Which probability is IMPOSSIBLE for a single roll of a standard die?	Rolling a 7 — A standard die has faces 1-6 only, so rolling a 7 is impossible (probability 0).
Which event is MORE LIKELY when rolling a single die?	Rolling a number greater than 2 — Rolling greater than 2 includes faces 3, 4, 5, 6 (4 favorable outcomes = 4/6), while each specific single number is only 1/6.
Which sum is MOST likely when rolling two 6-sided dice?	7 — Seven has the most combinations (1+6, 2+5, 3+4, 4+3, 5+2, 6+1) — six ways out of 36, more than any other sum.
If a game says 'roll 2 dice and add them', which sum is LEAST likely?	2 (or 12) — Only one combination produces 2 (1+1) and only one produces 12 (6+6), making these the rarest sums at 1/36 each.
What is the probability of rolling a 1 OR a 2 on a single die?	2 out of 6 (or 1/3) — There are two favorable outcomes (1 and 2) out of six total faces, so the probability is $2/6 = 1/3$.
In a player-vs-player dice duel, each player rolls 1d6 and the higher number wins. What's the probability of a tie?	6 out of 36 (or 1/6) — There are 6 tie outcomes (both rolling 1, both rolling 2, ... both rolling 6) out of 36 total pairs, giving probability $6/36 = 1/6$.
Why do board games often use TWO dice instead of one?	Two dice create a bell-curve distribution that makes mid-range numbers more common — Two dice produce sums from 2-12 with a bell-shaped distribution centered on 7. This makes mid-range outcomes common and extremes rare, useful for balanced gameplay.

2. Card Math

⌂ Question (fold →)	Answer
If a player draws a card and DOESN'T put it back, what changes for the next draw?	The deck has one fewer card, changing probabilities — Drawing without replacement reduces the deck by one card each time, so probabilities for the next draw change with each card removed.
If a deck has 36 cards and 3 of them are 'wild' cards, what is the probability of drawing a wild card?	1 out of 12 (or 3/36) — 3 wild cards out of 36 total cards gives probability $3/36 = 1/12$.
If you have a deck of 20 cards (10 red, 10 blue), what is the probability of drawing a RED card?	1 out of 2 (or 50%) — 10 favorable cards (red) out of 20 total gives probability $10/20 = 1/2$ or 50%.
What is the DISCARD PILE?	The face-up stack of cards that have already been played or thrown away — The discard pile is the face-up stack of cards that have been played, used, or discarded. It often gets reshuffled into the draw pile when empty.
A 'STARTING HAND' of 5 cards is dealt from a 40-card deck. How many cards remain in the deck for ONE player?	35 cards — Dealing 5 cards to one player leaves $40 - 5 = 35$ cards in the deck.
What does 'draw 2 cards' mean in a card game?	Take the top two cards from the draw pile — 'Draw' means taking the top card(s) from the face-down draw pile. 'Draw 2' specifically means taking the next two cards.
A custom deck has 24 cards. If 4 players each draw a 5-card hand, how many cards remain in the deck?	4 cards — Dealing 5 cards to 4 players uses 20 cards (4×5), leaving $24 - 20 = 4$ cards in the deck.
What does 'cut the deck' mean?	Split the deck into two parts and swap them — Cutting the deck means splitting it roughly in half and stacking the bottom portion on top of the top portion — an additional randomization step before dealing.
A 'PLAY PILE' is BEST defined as:	The center area where cards are played during a turn — The play pile (or play area) is the shared center space where cards are placed when played during the active turn.
Why do board games SHUFFLE the deck between rounds?	To randomize card order so future draws are unpredictable — Shuffling randomizes card order so players cannot predict what will be drawn next, keeping gameplay fair and uncertain.
Why might a game designer use a SMALLER deck (say 30 cards instead of 100)?	Smaller decks make probability swings more impactful and games shorter — A smaller deck makes each card matter more, increases the chance of seeing key cards, and typically shortens the game — all important design levers.
If a deck has 30 cards and 6 are 'special action' cards, what's the probability of drawing a special card?	1 out of 5 (or 6/30) — 6 special cards out of 30 total = $6/30 = 1/5 = 20\%$ probability.
Why do most card games have	Hidden information creates strategy, bluffing, and uncertainty — Hidden hands create information asymmetry — players must plan based

HIDDEN HANDS instead of face-up hands?	on incomplete information, enabling bluffing, prediction, and deeper strategy.
What is a 'HAND' in a card game?	The set of cards a player currently holds — A player's hand is the set of cards they currently hold, typically hidden from other players, that they can play during their turn.
How many cards are in a standard playing card deck?	52 — A standard deck has 4 suits (hearts, diamonds, clubs, spades) of 13 cards each, totaling 52 cards (plus optional jokers).
Why is it important to RESHUFFLE the discard pile when the draw deck runs out?	It keeps the game going by reusing cards already played — When the draw pile is empty, reshuffling the discard pile creates a new draw pile so the game can continue rather than ending abruptly.
Which of these makes drawing cards more EXCITING for players?	A mix of rare powerful cards and common ones — A mix of rare powerful cards and common cards creates anticipation, surprise, and 'wow' moments when a rare card appears, sustaining player engagement.
Why is a 'riffle shuffle' done MULTIPLE TIMES (about 7 for a 52-card deck)?	Multiple shuffles ensure the deck is sufficiently randomized — A single riffle leaves clumps from the original order. Mathematical research (by Bayer and Diaconis) shows about 7 riffle shuffles are needed to thoroughly randomize a 52-card deck.
In a card game, what is the DRAW PILE?	The face-down stack players take new cards from — The draw pile (or deck) is the face-down stack of unrevealed cards from which players take new cards on their turn.
What is the probability of drawing the ACE OF SPADES from a fresh 52-card deck?	1 out of 52 — There is exactly one Ace of Spades in the deck, so the probability of drawing it is $1/52$.
Why is it important that every player STARTS with the same number of cards in hand?	Fairness — equal starting resources prevent unfair advantage — Equal starting hands ensure no player begins with a built-in advantage, a core principle of fair game design.
A card game has 40 cards: 20 attack, 15 defense, 5 special. Which type is MOST common?	Attack (20 cards) — 20 attack cards is more than 15 defense or 5 special, making attack the most common card type.
What is the probability of drawing a heart from a standard 52-card deck?	1 out of 4 (or 13/52) — There are 13 hearts in a 52-card deck, so the probability is $13/52 = 1/4$ (25%).
A deck of 25 cards has 5 'win' cards. After drawing a win card without replacement, what's the probability the NEXT draw is also a win?	4 out of 24 — After removing one win card, 4 wins remain in 24 cards, so the next draw has probability $4/24 = 1/6$.
In a game with 60 cards and 4 players each drawing 10, how many cards remain?	20 cards — Dealing 10 cards to 4 players uses 40 cards, leaving $60 - 40 = 20$ cards.

3. Board Layouts

⌘ Question (fold →)	Answer
On a 10x10 grid board, how many EDGE squares (along the border) are there?	36 — Edge squares: 10 (top) + 10 (bottom) + 8 (left, minus corners already counted) + 8 (right, minus corners) = 36 border squares.
What is a 'START SPACE' on a board?	The space where all players begin the game — The start space is the designated beginning location where all player pieces are placed when the game begins.
What is a 'NODE' in a freeform board?	A specific location/space where pieces can rest — In freeform layouts, a node is a discrete location (like a city, region, or planet) where pieces are placed, connected to other nodes by edges or borders.
Which board layout is BEST for a game with 'territory control' as the main mechanic?	Freeform or hex — Territory control games need clearly defined regions to capture, which hex maps (Catan-style) or freeform region maps (Risk-style) provide naturally.
A PATH board is best described as:	A board where spaces form a track that players follow in sequence — A path board has spaces arranged in a linear or looping track. Players move sequentially along it, like Monopoly's loop or Candy Land's winding path.
A board has 100 spaces. If you roll a single d6 each turn, what's the FEWEST turns needed to traverse the board (always rolling 6)?	17 turns (since 16 turns of 6 = 96, need 1 more) — Rolling all 6s, 16 turns covers 96 spaces. The 17th turn covers the remaining 4 spaces, so 17 turns minimum.
Why do designers add SHORTCUTS to path boards?	Shortcuts add strategic decisions about risk versus reward — Shortcuts give players meaningful decisions — speed up but accept risk, or stay safe and slow. This adds strategy beyond just rolling dice.
Which board layout makes COLLISION between players MOST likely?	Path with single-file movement — A narrow single-file path forces players into the same spaces, maximizing collision and direct interaction. Larger or more open layouts let players spread out.
What is a 'CHOKEPOINT' on a board?	A narrow passage that forces players through a limited route — A chokepoint is a constricted area on the board where movement is forced through a narrow route — strategically important because controlling it controls movement.
A board has 20 spaces and a 'shortcut' that skips 5 spaces. How long is the shortcut path versus the regular path between the same two points?	5 spaces shorter than the regular path — A shortcut that 'skips 5 spaces' reduces the journey by 5 spaces compared to the regular path.
How many neighboring squares does a non-edge square on a chess grid have?	8 (including diagonals) — A square in the middle of a grid has 4 orthogonal neighbors and 4 diagonal neighbors = 8 total adjacent squares.
On a hex board with 19 hexes in a flower pattern (Catan-style), the center hex has how many	6 neighbors — A hexagon has 6 sides, so the center hex touches 6 surrounding hexes — all 6 neighbor positions are filled.

neighbors?	
Why would a designer use a FREEFORM map (like Risk) instead of a regular grid?	Freeform maps create thematic regions and unique strategic geography — Freeform maps (countries, planets, dungeons) match thematic content and create unique geographic features (peninsulas, chokepoints, oceans) that drive strategic identity.
Which board layout BEST encourages players to spread out and explore?	Large hex or freeform board with multiple regions — Large hex or freeform boards offer many regions and routes, encouraging exploration and spreading players apart, while small or linear boards crowd them.
If a path board has 40 spaces and a player starts at space 1, how many spaces are between them and the finish?	39 spaces — From space 1 to space 40, there are $40 - 1 = 39$ spaces of progress to make.
A FREEFORM board allows:	Spaces and connections arranged without a regular pattern — Freeform boards use spaces connected by arbitrary lines or borders (like Risk's countries or Catan's tile arrangement) rather than a regular grid pattern.
On a 5x5 grid board, how many total squares are there?	25 — A 5-row by 5-column grid has $5 \times 5 = 25$ squares total.
A 6x6 grid has 36 squares. If 4 are 'home' squares (one per corner), what fraction of squares are home squares?	1/9 — $4/36$ simplifies to $1/9$, meaning home squares make up $1/9$ of the board.
Why might a path board LOOP (form a circle) instead of having a clear start and end?	Looping paths let players keep playing through multiple rounds without resetting — Looping paths (like Monopoly) allow the game to continue indefinitely as players go around, accumulating resources or losses on each pass, instead of a fixed end.
What is a GRID board?	A board divided into equal squares arranged in rows and columns — A grid board has squares arranged in rows and columns (like chess), giving every space exactly four orthogonal neighbors (plus diagonals if allowed).
If a hex board is built from 7 hexes (1 center + 6 around), how many EDGES (shared sides) connect adjacent hexes?	6 — Each of the 6 outer hexes shares exactly one edge with the center hex, giving 6 adjacency edges total in this small flower pattern.
A racing board game would most likely use which layout?	Path layout — Path layouts naturally model races: players move along a defined track from start to finish, like Mario Kart or Formula D.
What is a HEX board's main advantage over a square grid?	Each space has 6 equidistant neighbors instead of 4, allowing more natural diagonal movement — Hexagonal spaces have 6 neighbors all the same distance away, unlike squares where diagonal neighbors are farther than orthogonal ones. This makes movement and ranges feel more natural.
Why might a designer choose a HEX board for a tactical war game?	Equal distances in 6 directions make tactical positioning feel fair — Hex boards give all 6 neighbors equal distance, so attack ranges and movement feel uniformly fair in all directions — important for tactical wargames.
An 'EDGE' in a board design connects:	Two nodes or spaces, defining a possible move — An edge connects two nodes (spaces), indicating that a piece can move directly between them. Edges define the game's movement graph.

4. Components

⌕ Question (fold →)	Answer
What is the PURPOSE of a 'STARTING PLAYER MARKER'?	To clearly show who acts first each round — A starting player marker (often a special token) clearly shows which player begins each round, often rotating clockwise to ensure fair first-player turns.
Why are POINT VALUES on cards often shown with both a NUMBER and an ICON?	To support players who learn visually or struggle with reading — Showing point values as numbers AND icons makes them readable for younger players, players unfamiliar with numerals, and improves quick visual scanning for all players.
A standard 'D6' is shaped like a:	Cube — A d6 is a cube — six equal square faces, the most common die shape, used since ancient times.
A 'PLAYER BOARD' is:	A small personal board each player uses to track their own resources and state — A player board is a small individual mat or board for each player to track their personal state — resources, characters, abilities — separate from the shared main board.
What is the MAIN reason designers playtest with PROTOTYPE components (paper, sketches) before manufacturing?	Prototypes are cheap to change, while manufactured components are not — Paper prototypes can be edited in minutes; manufactured components cost thousands of dollars to redesign. Testing with prototypes catches problems before they become expensive.
What is a 'TOKEN' in a board game?	A small movable piece that represents a player or game object — A token is any small physical piece used to represent something — a player's character, a resource (coin, gem), or a marker (life, time).
Why might a designer use a 'CUSTOM DIE' (with symbols instead of numbers)?	Symbols can directly show game outcomes (attack, defend, special) without translation — Custom symbol dice (skulls, shields, swords) communicate outcomes directly — players don't have to look up what 'rolled a 4' means. This speeds up play and adds theme.
If a game has 4 players and each player gets 5 tokens, how many tokens total are needed?	20 — $4 \text{ players} \times 5 \text{ tokens} = 20 \text{ tokens total in the box.}$
What is a 'STANDEE'?	A flat cardboard piece that stands upright in a plastic base — A standee is a flat cardboard piece slotted into a plastic or wooden base so it stands upright on the board, used as a cheaper alternative to plastic miniatures.
Why do designers think about COMPONENT WEIGHT and BOX SIZE?	Heavier or larger games cost more to ship and store — Component weight raises shipping costs; box size affects retail shelf space, storage, and consumer perception. Designers balance quality with logistics.
If 6 players need 8 cards each for setup, but the deck has 50 cards, what's the smallest deck size needed?	48 cards minimum — $6 \text{ players} \times 8 \text{ cards} = 48 \text{ cards needed for setup.}$ The 50-card deck is sufficient with 2 cards spare.
Why are GAME PIECES often made of WOOD or PLASTIC instead of paper?	Durability — wood and plastic survive many plays without damage — Wood and plastic resist bending, tearing, and warping over hundreds of plays, while paper degrades quickly. The cost is balanced against longevity.

If a game uses 'COINS' worth 1, 3, and 10, and a player has 1 of each, what total can they NOT make?	5 (or 6, 7, 8, 9 — anything between 4 and 10) — Possible sums: 1, 3, 4 (1+3), 10, 11 (10+1), 13 (10+3), 14 (10+3+1). Numbers 2, 5, 6, 7, 8, 9, 12 cannot be made.
If your game needs 60 cards in a deck and you print 4 unique designs equally, how many of each design?	15 of each design — 60 cards / 4 designs = 15 copies of each design.
What is the PURPOSE of distinct player colors in a game?	To let players quickly identify which pieces are theirs — Distinct player colors let players instantly tell their pieces apart from opponents', reducing confusion and speeding up play.
A game has 20 attack tokens and 15 defense tokens. What's the RATIO of attack to defense tokens?	4 to 3 — 20:15 simplified by dividing both numbers by 5 gives 4:3 — there are 4 attack tokens for every 3 defense tokens.
Which polyhedron is used for a 'D20'?	Icosahedron (20 triangular faces) — A d20 is an icosahedron with 20 equilateral triangular faces. It's standard in role-playing games like D&D.
Which is the MOST important consideration when sizing tokens for a board game?	Tokens must fit comfortably on board spaces without overlapping — Tokens must fit on the board spaces they're placed on, ideally with room for multiple if the game allows stacking, without overlapping illegibly.
Why should COLORBLIND PLAYERS be considered when choosing token colors?	Red-green colorblindness is common; using shape or icons in addition to color helps — About 1 in 12 men and 1 in 200 women have color vision deficiency. Distinguishing pieces by shape or pattern in addition to color makes games inclusive.
Why are CARD SLEEVES used by serious gamers?	To protect cards from wear, bending, and stains over many plays — Card sleeves protect cards from finger oils, spills, bending, and edge wear, extending the life of frequently-played games or competitive cards.
A 'MEEPLE' is:	A wooden person-shaped player token — A meeple is a wooden, person-shaped token popularized by the game Carcassonne. The term is now generic for human-shaped player pieces.
Why do some games use CUSTOM card backs (with art) instead of plain ones?	Custom backs help players identify card types in a face-down deck — Games with multiple decks (event, action, treasure) use different card backs so players can quickly grab from the correct deck without flipping cards over.
A game has 80 components total: 40 cards, 30 tokens, and some dice. How many dice?	10 dice — 80 total - 40 cards - 30 tokens = 10 dice.
A game uses score tokens worth 1, 5, and 10 points. To make 27 points using the FEWEST tokens, you'd use:	2 ten-tokens + 1 five-token + 2 one-tokens = 5 tokens — Using the largest denominations first: 2 tens (20) + 1 five (25) + 2 ones (27) = 5 tokens total, the minimum.
Why are RULEBOOKS often printed in MULTIPLE LANGUAGES for international games?	To make the game accessible to players in different countries without translation costs — Multi-language rulebooks let publishers sell the same physical product in multiple countries, reducing manufacturing costs and serving diverse players.

5. Game Balance

⌂ Question (fold →)	Answer
If a card costs 3 mana and deals 3 damage, it's 'on curve'. What's a card that costs 1 mana for 5 damage?	Overpowered — too much value for the cost — A 1-mana card dealing 5 damage gives far more output per cost than the standard 1:1 curve, making it overpowered relative to other cards.
Which of these is a way designers COUNTERACT first-player advantage?	Give later players bonus starting resources — Common balancing methods: give later players extra resources, change scoring order, let later players choose strategies first, or use a 'snake draft' for starting picks.
If a designer makes the FIRST PLAYER pay 1 extra resource per turn, this is BALANCING by:	Adding a cost to the first-player slot to offset the advantage — Adding costs to the advantaged position balances the game: first player keeps the move advantage but pays for it, evening expected outcomes.
Which playtester feedback would BEST signal a balance problem?	'Everyone who plays Faction X always wins' — Consistent feedback that one faction/strategy always wins reveals systemic imbalance. Single-game observations about luck or aesthetics don't signal balance issues.
'CATCH-UP MECHANICS' that are TOO STRONG cause what problem?	Leading players feel punished for playing well — winning becomes pointless — Overly strong catch-up systems make winning early pointless because leaders are constantly knocked back. Good design helps laggards compete without punishing skill.
In a game with 4 starting characters, you find one has a 50% win rate. What balance action should you take?	Nerf the 50% character or buff the others — If one character wins 50% in a 4-character game (expected 25%), it's overpowered. Either nerf it or buff the others until all win rates are roughly equal.
What is 'FIRST-PLAYER ADVANTAGE'?	The benefit one player gets simply by going first — First-player advantage is the statistical edge of going first — more turns, first picks, or first access to resources. Chess, for example, slightly favors White.
In a 2-player abstract game like Hex, what does the 'PIE RULE' do?	Player 2 can choose to swap sides after seeing Player 1's first move, neutralizing first-player advantage — The pie rule: after Player 1 makes the first move, Player 2 can either play normally OR swap sides. This forces Player 1 to make a 'fair' opening, balancing the game.
What is a 'DOMINANT STRATEGY'?	A strategy that is always better than other strategies, ruining game choices — A dominant strategy outperforms all others regardless of the situation. Its existence makes the game boring because choices stop mattering — balance fails.
Why do 'TIE-BREAKERS' need to be CLEARLY DEFINED in a balanced game?	Without clear tie-breakers, players argue and the game's outcome feels unfair — Clear tie-breaker rules (e.g., 'most remaining resources wins ties') prevent disputes and ensure the game has a definitive, fair outcome.
What does 'GAME BALANCE' mean?	All players have a fair chance to win regardless of starting position or choices — Game balance means every player has a fair chance to win — no single strategy, character, or starting position dominates.
If a game's win rate by seat position is: Seat 1 = 35%, Seat 2	Strong first-player advantage that needs balancing — Seat 1 wins more than twice as often as seat 4 — a clear sign of first-player advantage that the designer

= 28%, Seat 3 = 22%, Seat 4 = 15%, what does this suggest?	should address with compensation.
A balanced 5-player game should have each player winning approximately what fraction of games?	1/5 (20%) — Five equally-balanced players should each win about 1/5 (20%) of games. Significant deviation indicates imbalance.
A game balance EXPRESSION: if Strategy A wins 60% and Strategy B wins 40%, what's the difference?	Strategy A wins 20 percentage points more than B — $60\% - 40\% = 20$ percentage points difference. This is a significant imbalance — Strategy A should be nerfed or B buffed.
'NERFING' a game element means:	Reducing its power to balance the game — Nerfing means weakening an overpowered element — lowering damage, raising cost, restricting use — to bring it in line with other options.
What's the BEST way to verify your game is balanced after design changes?	Run multiple playtests with different players and track outcomes — Multiple playtests with varied players generate enough data to spot patterns. One playtest is too noisy; many tests reveal systemic balance issues clearly.
'BUFFING' a game element means:	Strengthening it to make it more competitive — Buffing means strengthening an underpowered element — increasing power, lowering cost, expanding use — so it can compete with stronger options.
'RUBBER-BANDING' in game design is:	Mechanisms that help losing players catch up, keeping games competitive — Rubber-banding gives trailing players advantages (better cards, catch-up bonuses, weakened leader) to keep games competitive and avoid runaway leaders.
The MEDIAN game length across 50 playtests is 42 minutes. What does this mean?	Half the games finished in less than 42 minutes and half in more — The median is the middle value: 25 games were shorter than 42 minutes and 25 were longer. The median resists being skewed by extreme outliers.
Why is 'KING-MAKING' considered a BALANCE PROBLEM in multiplayer games?	A losing player can decide who wins, robbing the leader and runner-up of agency — King-making happens when a losing player's actions decide who wins among others. It hurts game integrity because outcomes don't depend on skill of the contenders.
In a 100-game playtest, Character A wins 65 times. What does this suggest?	Character A may be overpowered and need a nerf — If 4 characters were balanced, each should win about 25% (25 of 100 games). A character winning 65% strongly suggests it is overpowered and needs adjusting.
If a game has 4 strategies with win rates 30%, 26%, 24%, 20%, which is the MOST balanced?	This IS reasonably balanced — Perfect balance is 25% each (1/4). Win rates from 20-30% are within an acceptable margin — all strategies are viable. Forcing absolute equality often kills variety. — all strategies are competitive.
Why is 'PERFECT BALANCE' often considered an UNREACHABLE goal?	Even tiny differences in strategy or skill change effective win rates — Real games have many interacting variables and skill differences. Designers aim for 'balanced enough' — strategies viable at competitive play, not mathematically equal.
Why is it BAD if a game's win rate depends mostly on TURN ORDER?	Players feel the game is decided by luck of the draw rather than skill — If turn order determines wins, player choices feel meaningless and skill cannot overcome a bad seat. This frustrates players and undermines replayability.
A 'POWER CURVE' in card design	How card strength relates to cost — A power curve ensures stronger cards

refers to:

cost more (mana, resources, turns) than weaker ones, so no card is strictly better than another at every cost.

6. Simulation

⌕ Question (fold →)	Answer
Why might a designer use a COMPUTER SIMULATION instead of physical playtests?	Computers can run millions of trials in minutes, while physical playtesting takes weeks — Computers run thousands of simulations instantly, allowing designers to test edge cases, rare events, and many configurations far faster than physical playtests.
In a Monte Carlo simulation of dice combat, the attacker wins 60%. With 4 attackers and 3 defenders, this means:	Attackers usually win these fights — a built-in attacker advantage — A 60% attacker win rate gives offense the edge. Designers must decide if this asymmetry is intended (favoring aggression) or needs balancing.
What is 'RANDOM SAMPLING' in a probability simulation?	Generating random inputs (dice, card draws) for each trial to reflect real gameplay — Random sampling simulates real game randomness — each trial uses fresh random dice rolls or shuffled cards, so the aggregate results mirror real probabilities.
Which is NOT a use of probability simulation in game design?	Deciding what art style to use — Simulations excel at numerical questions (win rates, game length, card frequency). Art style is a creative/aesthetic decision, not a statistical one.
A simulation shows Card A is drawn in 80% of games. What does this tell the designer?	Card A appears too often and may dominate strategies — If a card appears in 80% of games, it heavily shapes strategy. Designers may want to reduce its frequency to encourage variety and surprise.
Simulations use 'PSEUDORANDOM' numbers. Why?	Computers generate numbers that LOOK random but follow a formula — good enough for simulations — Computers use pseudorandom number generators — mathematical formulas that produce sequences with random-like statistical properties. They're sufficient for simulations.
A designer simulates 'rolling 3 dice and counting how often the sum is over 12'. What's the next step after coding the simulation?	Run many trials (e.g., 100,000) and tally the results — After writing the simulation code, run many trials and tally results. Many trials minimize random variation and give an accurate estimate.
If you simulate rolling 2 dice 10,000 times, you should see the sum of 7 appear about how often?	About 1,667 times — Sum of 7 has probability $6/36 = 1/6 \approx 16.67\%$. Over 10,000 trials, expect about 1,667 sevens (small random variation is normal).
Why is a LARGER number of simulation trials usually BETTER?	More trials reduce random variation and give more accurate estimates — By the Law of Large Numbers, more trials produce more accurate probability estimates. 10 trials might give 70% heads; 10,000 trials closely approaches 50%.
Why does 'TRIAL INDEPENDENCE' matter in simulation?	Each trial should not depend on previous trials, or the experimental probability will be biased — Independent trials let results aggregate correctly into probabilities. If trials affect each other (carry-over), the experimental probability misrepresents true gameplay.
Why is the LAW OF LARGE NUMBERS important for game simulation?	It guarantees experimental probability converges to theoretical as trials increase — The Law of Large Numbers says that as trial count grows, observed frequency approaches the true probability. This is why thousands of simulations give reliable results.

A game designer simulates 1000 games where Player A wins 350 times. The estimated win rate is:	35% — $350 \text{ wins} / 1000 \text{ games} = 0.35 = 35\%$ estimated win rate for Player A.
In a simulation, the 'CONFIDENCE INTERVAL' tells you:	The range within which the true probability likely falls based on your sample — A confidence interval (e.g., 95% CI of 23-27%) shows the range likely containing the true probability. More trials narrow this range.
'MONTE CARLO' methods are named after:	A casino — because they rely on random sampling — Monte Carlo methods are named after the famous casino in Monaco, reflecting that they use random sampling like games of chance to solve problems.
A simulation runs 5000 trials. Outcome X happens 1250 times. What's the experimental probability?	0.25 (or 25%) — $1250 / 5000 = 0.25$, or 25% experimental probability for outcome X.
A 'SEED' for a pseudorandom generator allows:	Reproducing the same sequence of 'random' numbers for debugging — A seed initializes the pseudorandom generator. Same seed produces same sequence, letting designers reproduce bugs or compare runs deterministically.
If a game ASSUMED a strategy wins 50% but simulation shows 70%, what should the designer DO?	Investigate why the simulation differs and likely adjust the strategy's cost or power — When simulation contradicts assumptions, trust the data. A 20-point gap suggests the strategy is undervalued in the model — investigate and rebalance.
If a SIMULATION shows 'all 4 strategies win between 23-27% of games', the designer should conclude:	The game is well balanced — Win rates of 23-27% across 4 strategies show all are within 2 percentage points of the expected 25% — indicating a well-balanced game.
If theoretical probability of an event is 0.25 and your simulation shows 0.30 after 100 trials, what should you do?	Run more trials — 100 is too few to converge — Small samples (100 trials) have high variance — a 5-point gap is normal. Run thousands of trials before suspecting a model error.
A designer wants to know 'how often does the game last over 60 minutes?'. Best approach?	Simulate 10,000 game lengths and count how many exceed 60 minutes — Simulating 10,000 game lengths and counting how many exceed 60 minutes gives a reliable estimate of the long-game probability.
Why do MODERN board games like 'Pandemic' or 'Wingspan' rely on simulation for design?	Their complex systems have too many variables to balance by intuition alone — Complex modern games involve thousands of card interactions and edge cases that human intuition can't fully evaluate. Simulation reveals systemic imbalances early.
What is a 'PROBABILITY SIMULATION'?	Running a game scenario many times to estimate likely outcomes — A probability simulation runs the same scenario many times (often with random inputs) to estimate the probability of different outcomes statistically.
A designer asks: 'Is my opening hand too lucky?' Best simulation:	Simulate 10,000 opening hands and check the distribution of strengths — Simulating 10,000 opening hands shows the full distribution of strengths — including how often 'too-lucky' hands occur, far more informative than anecdotes.
What's the difference between THEORETICAL and EXPERIMENTAL	Theoretical is calculated mathematically; experimental is measured from trials — Theoretical probability is computed from the math (e.g., $1/6$ for a die face). Experimental probability is what you actually observe over many

probability?	trials.
A simulation finds Strategy A wins 32% of games (target: 25%). The designer adjusts and re-simulates, finding 26%. What does this show?	The adjustment was effective — Moving from 32% to 26% (target 25%) shows the adjustment worked — Strategy A is now within typical balance margins.

7. Rulebooks

⌕ Question (fold →)	Answer
What is the PRIMARY GOAL of a board game rulebook?	To let players learn and play the game without outside help — A rulebook's primary purpose is to teach the game completely — players should be able to set up, play, and resolve every situation using only the rulebook.
The 'CREDITS' section of a rulebook typically lists:	Designer, artist, publisher, and playtesters — Credits acknowledge everyone who contributed: lead designer, artists, graphic designer, editor, playtesters, publisher.
A 'TABLE OF CONTENTS' helps rulebook readers by:	Letting them jump directly to relevant sections during play — A table of contents lets players quickly navigate to specific sections (combat, scoring, end-game) when questions arise mid-play.
Which sentence is MOST AMBIGUOUS?	'Players may use cards when it's appropriate.' — 'When it's appropriate' is fully subjective — every player will interpret it differently. The others give precise instructions with measurable conditions.
Which rulebook flaw is MOST critical to fix?	Players can't determine when the game ends — If players can't tell when the game ends, the game has no resolution. This is the most critical flaw — players will literally never finish.
Why are DIAGRAMS often used to show 'LEGAL MOVES'?	Visuals communicate spatial rules faster and more clearly than text — Diagrams excel at spatial information (legal moves, adjacency, ranges). They communicate at a glance what would take paragraphs in text.
Which is the BEST rule for handling EDGE CASES (rare or unusual situations)?	List them clearly in a 'Special Cases' section near the relevant rules — Document edge cases in a labeled section so players can find resolutions without searching. Hiding them leads to mid-game disputes.
A 'GLOSSARY' in a rulebook is BEST defined as:	An alphabetical list defining game-specific terms — A glossary alphabetically lists and defines game-specific jargon (e.g., 'Action Phase', 'Worker Token') so players can quickly look up unfamiliar terms.
A rulebook is 30 pages with 10 pages of examples and 5 of glossary. About what fraction is core rules?	1/2 (15 of 30 pages) — 30 total - 10 examples - 5 glossary = 15 pages core rules. $15/30 = 1/2$ of the book.
Which rulebook structure is BEST for learning a new game?	Overview -> Setup -> Turn Flow -> Special Rules -> End Conditions — Effective structure: Overview (what's the game?), Setup (start), Turn Flow (core loop), Special Rules (edge cases), End Conditions (when does it end?). This matches learning order.
A 'FAQ' section in a rulebook addresses:	Common questions and edge cases that confused playtesters — An FAQ collects questions playtesters repeatedly asked, answering edge cases that the main rules didn't fully clarify.
The 'WIN CONDITION' section should be:	Prominent and unambiguous so players always know how to win — Win conditions must be obvious and clearly written. If players don't know how to win, they cannot strategize. Place them prominently in the rulebook.
Why should rulebooks use	Numbered steps prevent missed actions and make order clear — Numbered steps create a clear, sequential checklist players can follow without missing or

'NUMBERED STEPS' for setup?	reordering critical setup actions.
If a rule has MULTIPLE INTERPRETATIONS, the designer should:	Rewrite the rule to remove ambiguity — Ambiguous rules cause disputes. The designer's job is to rewrite until only one interpretation is possible.
What is 'RULES CREEP'?	When special cases and exceptions accumulate, making the rulebook bloated and confusing — Rules creep happens when designers add many exceptions and special cases over revisions, making the rulebook complex and intimidating. Good design simplifies, not patches.
Why test a rulebook by 'BLIND PLAYTESTING' (without the designer present)?	The designer can't subconsciously fill in missing information — Blind playtesting (designer absent) reveals rulebook gaps because players can't ask the designer to clarify — exposing what the rulebook fails to communicate.
Why use ACTIVE VOICE in rulebooks ('Player draws a card') instead of PASSIVE ('A card is drawn by the player')?	Active voice is clearer and more direct, telling players exactly what to do — Active voice clearly identifies who does the action ('Player draws'), avoiding ambiguity about who acts. Passive constructions can obscure responsibility.
How does GOOD TYPOGRAPHY help a rulebook?	Headings, bullet points, and bold key terms make scanning easy — Clear headings, bullet points, and bolded key terms create visual hierarchy. Players can scan to find the rule they need without reading every word.
Why is a 'QUICK START GUIDE' valuable alongside a full rulebook?	Players can learn the basics fast and reference the full rules later for details — A quick start guide teaches the essentials in 1-2 pages, getting players playing fast. The full rulebook supports them with details as needed.
Which sentence has POOR rulebook style?	'If you want, maybe you could draw some cards or not.' — Vague, hesitant phrasing ('if you want', 'maybe', 'some') makes a rulebook unusable. Replace with direct commands: 'Draw exactly 2 cards.'
Which sentence is BEST for a rulebook?	'Each turn, the active player draws 2 cards.' — Precise language ('Each turn, the active player draws 2 cards') eliminates ambiguity. Vague phrases ('might', 'usual', 'a few') lead to interpretation disputes.
Why does a rulebook often include EXAMPLES with illustrations?	Examples show how rules apply in practice, clarifying abstract instructions — Examples (especially illustrated ones) demonstrate how rules play out, helping players understand abstract instructions through concrete scenarios.
Why are 'PLAYER AID CARDS' helpful in addition to the rulebook?	Quick references summarize core actions without rereading the full rules — Player aid cards summarize each turn's options on a small card players keep at hand, eliminating constant rulebook checks during play.
A rulebook says 'Draw cards equal to your score'. A playtester scores 0 and asks 'Do I draw 0 cards?'. The rulebook should:	Explicitly state how to handle 0 — Good rulebooks explicitly handle boundary cases (0 cards, negative values, ties). Ambiguity here causes mid-game disputes. E.g., 'Draw 0 cards if your score is 0'.
What does 'CONSISTENT TERMINOLOGY' mean in a rulebook?	Using the same word for the same concept throughout — not switching between synonyms — Consistent terminology means using the same word for the same thing every time. Switching between 'token', 'piece', and 'marker' confuses players about whether they're the same.

8. Playtesting

⌕ Question (fold →)	Answer
If 90% of testers say setup is 'too long', the BEST response is:	Find ways to shorten or simplify setup — Overwhelming consensus (90%) signals a real issue. Long setup discourages players from getting the game to the table. Designers should simplify setup aggressively.
A playtest finds the game takes 90 minutes when targeting 30 minutes. The designer should:	Identify what slows the game and trim or simplify it — Triple the target length signals the game is too complex. The designer identifies slow phases or unnecessary mechanics and trims them.
What is PLAYTESTING?	Playing your game with people to gather feedback and find problems — Playtesting is the iterative process of having real players play your game to identify bugs, balance issues, confusion points, and overall fun.
What is 'ITERATIVE DESIGN'?	Repeatedly testing, learning, and improving the design in cycles — Iterative design cycles through: design -> playtest -> learn -> revise -> playtest again. Each loop improves the game based on real evidence.
Why is RECORDING (notes or video) important during playtesting?	Memory fades; recordings preserve every issue and reaction for later analysis — Notes or video recordings capture every confusion, rule question, and player reaction. Reviewing them later reveals issues missed in the moment.
What is an 'ALPHA PROTOTYPE'?	An early, rough version made to test core mechanics — An alpha prototype is the earliest playable version, often hand-drawn or printed simply, used to test whether the core game mechanics work before investing in art.
Why should designers PLAYTEST WITH STRANGERS, not just friends?	Friends may sugarcoat feedback; strangers give honest reactions — Friends often hold back negative feedback to spare feelings. Strangers, especially target-audience players, give honest reactions critical for improvement.
Which playtest metric is MOST useful for measuring 'fun'?	'Would you play this again?' — Asking 'Would you play again?' is a concrete proxy for fun. Players who say 'yes' enjoyed the experience; 'no' or hesitation indicates problems.
Why do designers test EARLY and OFTEN rather than waiting until the design feels 'done'?	Problems are easier to fix early; major issues found late require huge rework — Early playtesting catches structural problems when they are cheap to fix (a paper change). Waiting until 'done' means rework on art, components, and rules all at once.
The PURPOSE of a 'PLAYTEST LOG' is to:	Track changes between versions and what each playtest revealed — A playtest log records every version, what was tested, what feedback came in, and what changed. This history prevents repeating mistakes and shows design evolution.
What is a 'BETA PROTOTYPE'?	A more polished prototype with refined rules and art for broader testing — Beta prototypes have refined rules and improved (but not final) art. They are tested with strangers to verify the game works without the designer present.
In 10 playtests, the game lasted (in	

minutes): 25, 30, 28, 31, 27, 29, 95, 30, 26, 28. The 95 is an OUTLIER. What's the MEDIAN length WITHOUT the outlier?	28.5 minutes — Sorted without outlier: 25, 26, 27, 28, 28, 29, 30, 30, 31. Median (5th of 9) is 28. Including outlier and taking median of 10 sorted: 28.5.
Which feedback type is MOST useful from a playtest?	'I was confused on turn 3 when I drew an event card' — Specific feedback ('confused on turn 3 by event cards') is actionable. Vague feedback ('it was good') doesn't help the designer fix anything.
Why are 'BLIND PLAYTESTS' (designer absent) essential before publishing?	They reveal rulebook problems hidden when the designer can verbally clarify — When the designer is present, they unconsciously fill in rulebook gaps. Blind tests force the rulebook to stand alone — revealing what it fails to communicate.
What does 'SCOPE CREEP' mean in game design?	Adding features and complexity beyond the original design goal — Scope creep happens when designers keep adding mechanics, factions, or modules beyond the original vision, leading to bloated, unfocused games that take forever to finish.
What is 'OBSERVER MODE' playtesting?	Watching players play without intervening, to see where the game itself struggles — In observer mode, the designer watches silently as players figure things out. This reveals whether the rulebook and game communicate clearly without designer help.
What does 'AHA MOMENT' mean in playtesting?	When a player suddenly understands the game's strategy or appeal — An aha moment is when a player suddenly 'gets it' — understanding strategy, seeing depth, or feeling the fun. Designers aim to deliver this within the first few turns.
Why do designers playtest with the GAME'S TARGET AGE GROUP (e.g., 9-14 year olds for kid games)?	Younger or older testers have different comprehension and tastes; you must test with the actual audience — Adults may breeze through rules that confuse kids, and vice versa. Testing with the actual target audience reveals real-world reception — adult-only testing gives misleading data.
A 'POST-PLAYTEST INTERVIEW' should ask:	Open-ended questions about specific moments, decisions, and confusions — Effective interviews ask about specific moments ('What confused you about turn 5?'), open-ended reactions, and decisions — yielding richer feedback than yes/no questions.
Why is it BAD to change MANY things AT ONCE between playtests?	You can't tell which change caused which effect — Changing multiple things at once makes it impossible to attribute observed effects to specific changes. Change one or two things per playtest cycle for clean analysis.
'KILLER FEEDBACK' is feedback that:	Reveals a fundamental problem requiring significant redesign — Killer feedback exposes deep problems — a broken core mechanic, no fun, fatal balance issues — that need major redesign. Painful but essential to hear.
If a playtester quits the game halfway through, this likely means:	The game is failing to engage them — When players abandon a game mid-play, the game lost their engagement. Designers should investigate where engagement collapsed (boring phase, snowball loss, too long). — investigate why immediately.
After many playtests, the designer decides the game is 'good enough'. What's the next step?	Move to art finalization, manufacturing, and publishing — Once playtesting confirms the game is solid, the next phase is finalizing art, manufacturing components, finalizing the rulebook, and preparing for publishing or kickstart.

Which playtest result suggests the game is READY for publishing?	Diverse testers consistently rate it 4-5 stars and want to play again — Consistent 4-5 star ratings and repeat-play interest across diverse testers indicate the game is genuinely engaging — a strong sign of readiness for publishing.
If 5 of 10 playtesters say a specific card is overpowered, the designer should:	Investigate the card seriously — When half of testers spontaneously raise the same issue, it's a systemic problem, not opinion. Investigate the card's power level and likely nerf it. — consistent feedback signals a real issue.

9. Kingmaker Problem Player Elimination

⌂ Question (fold →)	Answer
A game balance EXPRESSION: if Strategy A wins 60% and Strategy B wins 40%, what's the difference?	Strategy A wins 20 percentage points more than B — $60\% - 40\% = 20$ percentage points difference. This is a significant imbalance — Strategy A should be nerfed or B buffed.
Which sentence is BEST for a rulebook?	'Each turn, the active player draws 2 cards.' — Precise language ('Each turn, the active player draws 2 cards') eliminates ambiguity. Vague phrases ('might', 'usual', 'a few') lead to interpretation disputes.
'BUFFING' a game element means:	Strengthening it to make it more competitive — Buffing means strengthening an underpowered element — increasing power, lowering cost, expanding use — so it can compete with stronger options.
A designer wants to know 'how often does the game last over 60 minutes?'. Best approach?	Simulate 10,000 game lengths and count how many exceed 60 minutes — Simulating 10,000 game lengths and counting how many exceed 60 minutes gives a reliable estimate of the long-game probability.
Why do board games often use TWO dice instead of one?	Two dice create a bell-curve distribution that makes mid-range numbers more common — Two dice produce sums from 2-12 with a bell-shaped distribution centered on 7. This makes mid-range outcomes common and extremes rare, useful for balanced gameplay.
If you have a deck of 20 cards (10 red, 10 blue), what is the probability of drawing a RED card?	1 out of 2 (or 50%) — 10 favorable cards (red) out of 20 total gives probability $10/20 = 1/2$ or 50%.
What does 'SCOPE CREEP' mean in game design?	Adding features and complexity beyond the original design goal — Scope creep happens when designers keep adding mechanics, factions, or modules beyond the original vision, leading to bloated, unfocused games that take forever to finish.
A simulation runs 5000 trials. Outcome X happens 1250 times. What's the experimental probability?	0.25 (or 25%) — $1250 / 5000 = 0.25$, or 25% experimental probability for outcome X.
If 90% of testers say setup is 'too long', the BEST response is:	Find ways to shorten or simplify setup — Overwhelming consensus (90%) signals a real issue. Long setup discourages players from getting the game to the table. Designers should simplify setup aggressively.
If a game has 4 players and each player gets 5 tokens, how many tokens total are needed?	20 — $4 \text{ players} \times 5 \text{ tokens} = 20 \text{ tokens total in the box.}$
Why is RECORDING (notes or video) important during playtesting?	Memory fades; recordings preserve every issue and reaction for later analysis — Notes or video recordings capture every confusion, rule question, and player reaction. Reviewing them later reveals issues missed in the moment.
What is the probability of rolling a 4 on a fair 6-sided die?	1 out of 6 — There is exactly one face with a 4, and six faces total, so the probability is $1/6$.
On a 5x5 grid board, how many total squares are there?	25 — A 5-row by 5-column grid has $5 \times 5 = 25$ squares total.

A board has 20 spaces and a 'shortcut' that skips 5 spaces. How long is the shortcut path versus the regular path between the same two points?	5 spaces shorter than the regular path — A shortcut that 'skips 5 spaces' reduces the journey by 5 spaces compared to the regular path.
If your game needs 60 cards in a deck and you print 4 unique designs equally, how many of each design?	15 of each design — $60 \text{ cards} / 4 \text{ designs} = 15 \text{ copies of each design}$.
A racing board game would most likely use which layout?	Path layout — Path layouts naturally model races: players move along a defined track from start to finish, like Mario Kart or Formula D.
A designer simulates 'rolling 3 dice and counting how often the sum is over 12'. What's the next step after coding the simulation?	Run many trials (e.g., 100,000) and tally the results — After writing the simulation code, run many trials and tally results. Many trials minimize random variation and give an accurate estimate.
Why are CARD SLEEVES used by serious gamers?	To protect cards from wear, bending, and stains over many plays — Card sleeves protect cards from finger oils, spills, bending, and edge wear, extending the life of frequently-played games or competitive cards.
Why do board games SHUFFLE the deck between rounds?	To randomize card order so future draws are unpredictable — Shuffling randomizes card order so players cannot predict what will be drawn next, keeping gameplay fair and uncertain.
What is the probability of drawing a heart from a standard 52-card deck?	1 out of 4 (or 13/52) — There are 13 hearts in a 52-card deck, so the probability is $13/52 = 1/4$ (25%).
A game has 20 attack tokens and 15 defense tokens. What's the RATIO of attack to defense tokens?	4 to 3 — $20:15$ simplified by dividing both numbers by 5 gives $4:3$ — there are 4 attack tokens for every 3 defense tokens.
What is the probability of rolling an EVEN number on a standard die?	3 out of 6 (or 1/2) — There are three even faces (2, 4, 6) out of six, giving probability $3/6 = 1/2$ or 50%.
In a game with 4 starting characters, you find one has a 50% win rate. What balance action should you take?	Nerf the 50% character or buff the others — If one character wins 50% in a 4-character game (expected 25%), it's overpowered. Either nerf it or buff the others until all win rates are roughly equal.
A 'TABLE OF CONTENTS' helps rulebook readers by:	Letting them jump directly to relevant sections during play — A table of contents lets players quickly navigate to specific sections (combat, scoring, end-game) when questions arise mid-play.
What is the probability of drawing the ACE OF SPADES from a fresh 52-card deck?	1 out of 52 — There is exactly one Ace of Spades in the deck, so the probability of drawing it is $1/52$.

10. Victory Condition Design

⌕ Question (fold →)	Answer
A racing board game would most likely use which layout?	Path layout — Path layouts naturally model races: players move along a defined track from start to finish, like Mario Kart or Formula D.
Which sum is MOST likely when rolling two 6-sided dice?	7 — Seven has the most combinations (1+6, 2+5, 3+4, 4+3, 5+2, 6+1) — six ways out of 36, more than any other sum.
If a hex board is built from 7 hexes (1 center + 6 around), how many EDGES (shared sides) connect adjacent hexes?	6 — Each of the 6 outer hexes shares exactly one edge with the center hex, giving 6 adjacency edges total in this small flower pattern.
If your game needs 60 cards in a deck and you print 4 unique designs equally, how many of each design?	15 of each design — 60 cards / 4 designs = 15 copies of each design.
A board has 20 spaces and a 'shortcut' that skips 5 spaces. How long is the shortcut path versus the regular path between the same two points?	5 spaces shorter than the regular path — A shortcut that 'skips 5 spaces' reduces the journey by 5 spaces compared to the regular path.
Why would a designer use a FREEFORM map (like Risk) instead of a regular grid?	Freeform maps create thematic regions and unique strategic geography — Freeform maps (countries, planets, dungeons) match thematic content and create unique geographic features (peninsulas, chokepoints, oceans) that drive strategic identity.
If a game uses 'COINS' worth 1, 3, and 10, and a player has 1 of each, what total can they NOT make?	5 (or 6, 7, 8, 9 — anything between 4 and 10) — Possible sums: 1, 3, 4 (1+3), 10, 11 (10+1), 13 (10+3), 14 (10+3+1). Numbers 2, 5, 6, 7, 8, 9, 12 cannot be made.
If a rule has MULTIPLE INTERPRETATIONS, the designer should:	Rewrite the rule to remove ambiguity — Ambiguous rules cause disputes. The designer's job is to rewrite until only one interpretation is possible.
'CATCH-UP MECHANICS' that are TOO STRONG cause what problem?	Leading players feel punished for playing well — winning becomes pointless — Overly strong catch-up systems make winning early pointless because leaders are constantly knocked back. Good design helps laggards compete without punishing skill.
If a deck has 36 cards and 3 of them are 'wild' cards, what is the probability of drawing a wild card?	1 out of 12 (or 3/36) — 3 wild cards out of 36 total cards gives probability $3/36 = 1/12$.
A card game has 40 cards: 20 attack, 15 defense, 5 special. Which type is MOST common?	Attack (20 cards) — 20 attack cards is more than 15 defense or 5 special, making attack the most common card type.
Why are 'BLIND PLAYTESTS' (designer absent) essential before publishing?	They reveal rulebook problems hidden when the designer can verbally clarify — When the designer is present, they unconsciously fill in rulebook gaps. Blind tests force the rulebook to stand alone — revealing what it fails to communicate.
A custom deck has 24 cards. If 4 players each draw a 5-card hand, how	4 cards — Dealing 5 cards to 4 players uses 20 cards (4 x 5), leaving 24 - 20

many cards remain in the deck?	= 4 cards in the deck.
In a 2-player abstract game like Hex, what does the 'PIE RULE' do?	Player 2 can choose to swap sides after seeing Player 1's first move, neutralizing first-player advantage — The pie rule: after Player 1 makes the first move, Player 2 can either play normally OR swap sides. This forces Player 1 to make a 'fair' opening, balancing the game.
A game has 20 attack tokens and 15 defense tokens. What's the RATIO of attack to defense tokens?	4 to 3 — 20:15 simplified by dividing both numbers by 5 gives 4:3 — there are 4 attack tokens for every 3 defense tokens.
Why do 'TIE-BREAKERS' need to be CLEARLY DEFINED in a balanced game?	Without clear tie-breakers, players argue and the game's outcome feels unfair — Clear tie-breaker rules (e.g., 'most remaining resources wins ties') prevent disputes and ensure the game has a definitive, fair outcome.
Which is NOT a use of probability simulation in game design?	Deciding what art style to use — Simulations excel at numerical questions (win rates, game length, card frequency). Art style is a creative/aesthetic decision, not a statistical one.
Why might a designer use a 'CUSTOM DIE' (with symbols instead of numbers)?	Symbols can directly show game outcomes (attack, defend, special) without translation — Custom symbol dice (skulls, shields, swords) communicate outcomes directly — players don't have to look up what 'rolled a 4' means. This speeds up play and adds theme.
Why are RULEBOOKS often printed in MULTIPLE LANGUAGES for international games?	To make the game accessible to players in different countries without translation costs — Multi-language rulebooks let publishers sell the same physical product in multiple countries, reducing manufacturing costs and serving diverse players.
Why are POINT VALUES on cards often shown with both a NUMBER and an ICON?	To support players who learn visually or struggle with reading — Showing point values as numbers AND icons makes them readable for younger players, players unfamiliar with numerals, and improves quick visual scanning for all players.
If a designer makes the FIRST PLAYER pay 1 extra resource per turn, this is BALANCING by:	Adding a cost to the first-player slot to offset the advantage — Adding costs to the advantaged position balances the game: first player keeps the move advantage but pays for it, evening expected outcomes.
How many neighboring squares does a non-edge square on a chess grid have?	8 (including diagonals) — A square in the middle of a grid has 4 orthogonal neighbors and 4 diagonal neighbors = 8 total adjacent squares.
In 10 playtests, the game lasted (in minutes): 25, 30, 28, 31, 27, 29, 95, 30, 26, 28. The 95 is an OUTLIER. What's the MEDIAN length WITHOUT the outlier?	28.5 minutes — Sorted without outlier: 25, 26, 27, 28, 28, 29, 30, 30, 31. Median (5th of 9) is 28. Including outlier and taking median of 10 sorted: 28.5.
Which sentence is MOST AMBIGUOUS?	'Players may use cards when it's appropriate.' — 'When it's appropriate' is fully subjective — every player will interpret it differently. The others give precise instructions with measurable conditions.
A rulebook says 'Draw cards equal to your score'. A playtester scores 0 and asks 'Do I draw 0 cards?'. The rulebook	Explicitly state how to handle 0 — Good rulebooks explicitly handle boundary cases (0 cards, negative values, ties). Ambiguity here causes mid-game disputes. E.g., 'Draw 0 cards if your score is 0'.

should:

11. Game Theory Basics

⌘ Question (fold →)	Answer
Which of these is a way designers COUNTERACT first-player advantage?	Give later players bonus starting resources — Common balancing methods: give later players extra resources, change scoring order, let later players choose strategies first, or use a 'snake draft' for starting picks.
A rulebook says 'Draw cards equal to your score'. A playtester scores 0 and asks 'Do I draw 0 cards?'. The rulebook should:	Explicitly state how to handle 0 — Good rulebooks explicitly handle boundary cases (0 cards, negative values, ties). Ambiguity here causes mid-game disputes. E.g., 'Draw 0 cards if your score is 0'.
A card game has 40 cards: 20 attack, 15 defense, 5 special. Which type is MOST common?	Attack (20 cards) — 20 attack cards is more than 15 defense or 5 special, making attack the most common card type.
Why is it BAD if a game's win rate depends mostly on TURN ORDER?	Players feel the game is decided by luck of the draw rather than skill — If turn order determines wins, player choices feel meaningless and skill cannot overcome a bad seat. This frustrates players and undermines replayability.
In a player-vs-player dice duel, each player rolls 1d6 and the higher number wins. What's the probability of a tie?	6 out of 36 (or 1/6) — There are 6 tie outcomes (both rolling 1, both rolling 2, ... both rolling 6) out of 36 total pairs, giving probability $6/36 = 1/6$.
Which playtest metric is MOST useful for measuring 'fun'?	'Would you play this again?' — Asking 'Would you play again?' is a concrete proxy for fun. Players who say 'yes' enjoyed the experience; 'no' or hesitation indicates problems.
If a path board has 40 spaces and a player starts at space 1, how many spaces are between them and the finish?	39 spaces — From space 1 to space 40, there are $40 - 1 = 39$ spaces of progress to make.
In a Monte Carlo simulation of dice combat, the attacker wins 60%. With 4 attackers and 3 defenders, this means:	Attackers usually win these fights — a built-in attacker advantage — A 60% attacker win rate gives offense the edge. Designers must decide if this asymmetry is intended (favoring aggression) or needs balancing.
Why do most card games have HIDDEN HANDS instead of face-up hands?	Hidden information creates strategy, bluffing, and uncertainty — Hidden hands create information asymmetry — players must plan based on incomplete information, enabling bluffing, prediction, and deeper strategy.
Which design choice would make a dice game MORE random?	Use one d20 instead of two d6 — A single d20 has 20 equally likely outcomes (high variance, uniform). 2d6 has a bell curve clustered around 7 (less random feel). The d20 is 'more random'.
Why is 'KING-MAKING' considered a BALANCE PROBLEM in multiplayer games?	A losing player can decide who wins, robbing the leader and runner-up of agency — King-making happens when a losing player's actions decide who wins among others. It hurts game integrity because outcomes don't depend on skill of the contenders.

A game has 80 components total: 40 cards, 30 tokens, and some dice. How many dice?	10 dice — 80 total - 40 cards - 30 tokens = 10 dice.
Why are RULEBOOKS often printed in MULTIPLE LANGUAGES for international games?	To make the game accessible to players in different countries without translation costs — Multi-language rulebooks let publishers sell the same physical product in multiple countries, reducing manufacturing costs and serving diverse players.
If a game ASSUMED a strategy wins 50% but simulation shows 70%, what should the designer DO?	Investigate why the simulation differs and likely adjust the strategy's cost or power — When simulation contradicts assumptions, trust the data. A 20-point gap suggests the strategy is undervalued in the model — investigate and rebalance.
Why is a 'QUICK START GUIDE' valuable alongside a full rulebook?	Players can learn the basics fast and reference the full rules later for details — A quick start guide teaches the essentials in 1-2 pages, getting players playing fast. The full rulebook supports them with details as needed.
Why might a designer choose a HEX board for a tactical war game?	Equal distances in 6 directions make tactical positioning feel fair — Hex boards give all 6 neighbors equal distance, so attack ranges and movement feel uniformly fair in all directions — important for tactical wargames.
Why should designers PLAYTEST WITH STRANGERS, not just friends?	Friends may sugarcoat feedback; strangers give honest reactions — Friends often hold back negative feedback to spare feelings. Strangers, especially target-audience players, give honest reactions critical for improvement.
What's the BEST way to verify your game is balanced after design changes?	Run multiple playtests with different players and track outcomes — Multiple playtests with varied players generate enough data to spot patterns. One playtest is too noisy; many tests reveal systemic balance issues clearly.
A designer simulates 'rolling 3 dice and counting how often the sum is over 12'. What's the next step after coding the simulation?	Run many trials (e.g., 100,000) and tally the results — After writing the simulation code, run many trials and tally results. Many trials minimize random variation and give an accurate estimate.
A deck of 25 cards has 5 'win' cards. After drawing a win card without replacement, what's the probability the NEXT draw is also a win?	4 out of 24 — After removing one win card, 4 wins remain in 24 cards, so the next draw has probability $4/24 = 1/6$.
Why are POINT VALUES on cards often shown with both a NUMBER and an ICON?	To support players who learn visually or struggle with reading — Showing point values as numbers AND icons makes them readable for younger players, players unfamiliar with numerals, and improves quick visual scanning for all players.
Which sentence is BEST for a rulebook?	'Each turn, the active player draws 2 cards.' — Precise language ('Each turn, the active player draws 2 cards') eliminates ambiguity. Vague phrases ('might', 'usual', 'a few') lead to interpretation disputes.
A 'STARTING HAND' of 5 cards is dealt from a 40-card deck. How many cards remain in the deck for ONE player?	35 cards — Dealing 5 cards to one player leaves $40 - 5 = 35$ cards in the deck.

Why might a game designer use a SMALLER deck (say 30 cards instead of 100)?	Smaller decks make probability swings more impactful and games shorter — A smaller deck makes each card matter more, increases the chance of seeing key cards, and typically shortens the game — all important design levers.
Why is a 'riffle shuffle' done MULTIPLE TIMES (about 7 for a 52-card deck)?	Multiple shuffles ensure the deck is sufficiently randomized — A single riffle leaves clumps from the original order. Mathematical research (by Bayer and Diaconis) shows about 7 riffle shuffles are needed to thoroughly randomize a 52-card deck.

12. Production And Manufacturing

⌕ Question (fold →)	Answer
Which board layout BEST encourages players to spread out and explore?	Large hex or freeform board with multiple regions — Large hex or freeform boards offer many regions and routes, encouraging exploration and spreading players apart, while small or linear boards crowd them.
In a 2-player abstract game like Hex, what does the 'PIE RULE' do?	Player 2 can choose to swap sides after seeing Player 1's first move, neutralizing first-player advantage — The pie rule: after Player 1 makes the first move, Player 2 can either play normally OR swap sides. This forces Player 1 to make a 'fair' opening, balancing the game.
Why test a rulebook by 'BLIND PLAYTESTING' (without the designer present)?	The designer can't subconsciously fill in missing information — Blind playtesting (designer absent) reveals rulebook gaps because players can't ask the designer to clarify — exposing what the rulebook fails to communicate.
Which event is MORE LIKELY when rolling a single die?	Rolling a number greater than 2 — Rolling greater than 2 includes faces 3, 4, 5, 6 (4 favorable outcomes = 4/6), while each specific single number is only 1/6.
Why might a path board LOOP (form a circle) instead of having a clear start and end?	Looping paths let players keep playing through multiple rounds without resetting — Looping paths (like Monopoly) allow the game to continue indefinitely as players go around, accumulating resources or losses on each pass, instead of a fixed end.
Why do MODERN board games like 'Pandemic' or 'Wingspan' rely on simulation for design?	Their complex systems have too many variables to balance by intuition alone — Complex modern games involve thousands of card interactions and edge cases that human intuition can't fully evaluate. Simulation reveals systemic imbalances early.
Why would a designer use a FREEFORM map (like Risk) instead of a regular grid?	Freeform maps create thematic regions and unique strategic geography — Freeform maps (countries, planets, dungeons) match thematic content and create unique geographic features (peninsulas, chokepoints, oceans) that drive strategic identity.
Why is a 'riffle shuffle' done MULTIPLE TIMES (about 7 for a 52-card deck)?	Multiple shuffles ensure the deck is sufficiently randomized — A single riffle leaves clumps from the original order. Mathematical research (by Bayer and Diaconis) shows about 7 riffle shuffles are needed to thoroughly randomize a 52-card deck.
Why should COLORBLIND PLAYERS be considered when choosing token colors?	Red-green colorblindness is common; using shape or icons in addition to color helps — About 1 in 12 men and 1 in 200 women have color vision deficiency. Distinguishing pieces by shape or pattern in addition to color makes games inclusive.
A card game has 40 cards: 20 attack, 15 defense, 5 special. Which type is MOST common?	Attack (20 cards) — 20 attack cards is more than 15 defense or 5 special, making attack the most common card type.
Which playtest metric is MOST useful for measuring 'fun'?	'Would you play this again?' — Asking 'Would you play again?' is a concrete proxy for fun. Players who say 'yes' enjoyed the experience; 'no' or hesitation indicates problems.

If a card costs 3 mana and deals 3 damage, it's 'on curve'. What's a card that costs 1 mana for 5 damage?	Overpowered — too much value for the cost — A 1-mana card dealing 5 damage gives far more output per cost than the standard 1:1 curve, making it overpowered relative to other cards.
Why are 'BLIND PLAYTESTS' (designer absent) essential before publishing?	They reveal rulebook problems hidden when the designer can verbally clarify — When the designer is present, they unconsciously fill in rulebook gaps. Blind tests force the rulebook to stand alone — revealing what it fails to communicate.
Which board layout is BEST for a game with 'territory control' as the main mechanic?	Freeform or hex — Territory control games need clearly defined regions to capture, which hex maps (Catan-style) or freeform region maps (Risk-style) provide naturally.
If a game ASSUMED a strategy wins 50% but simulation shows 70%, what should the designer DO?	Investigate why the simulation differs and likely adjust the strategy's cost or power — When simulation contradicts assumptions, trust the data. A 20-point gap suggests the strategy is undervalued in the model — investigate and rebalance.
A game gives bonus coins when you roll doubles (both dice the same). What's the probability of rolling doubles with 2 dice?	6 out of 36 (or 1/6) — Doubles are (1,1), (2,2), (3,3), (4,4), (5,5), (6,6) — six outcomes out of 36 total, giving probability $6/36 = 1/6$.
In a Monte Carlo simulation of dice combat, the attacker wins 60%. With 4 attackers and 3 defenders, this means:	Attackers usually win these fights — a built-in attacker advantage — A 60% attacker win rate gives offense the edge. Designers must decide if this asymmetry is intended (favoring aggression) or needs balancing.
A playtest finds the game takes 90 minutes when targeting 30 minutes. The designer should:	Identify what slows the game and trim or simplify it — Triple the target length signals the game is too complex. The designer identifies slow phases or unnecessary mechanics and trims them.
In 10 playtests, the game lasted (in minutes): 25, 30, 28, 31, 27, 29, 95, 30, 26, 28. The 95 is an OUTLIER. What's the MEDIAN length WITHOUT the outlier?	28.5 minutes — Sorted without outlier: 25, 26, 27, 28, 28, 29, 30, 30, 31. Median (5th of 9) is 28. Including outlier and taking median of 10 sorted: 28.5.
If a game says 'roll 2 dice and add them', which sum is LEAST likely?	2 (or 12) — Only one combination produces 2 (1+1) and only one produces 12 (6+6), making these the rarest sums at $1/36$ each.
What is the MAIN reason designers playtest with PROTOTYPE components (paper, sketches) before manufacturing?	Prototypes are cheap to change, while manufactured components are not — Paper prototypes can be edited in minutes; manufactured components cost thousands of dollars to redesign. Testing with prototypes catches problems before they become expensive.
If a game uses 'COINS' worth 1, 3, and 10, and a player has 1 of each, what total can they NOT make?	5 (or 6, 7, 8, 9 — anything between 4 and 10) — Possible sums: 1, 3, 4 (1+3), 10, 11 (10+1), 13 (10+3), 14 (10+3+1). Numbers 2, 5, 6, 7, 8, 9, 12 cannot be made.
Which rulebook structure is BEST for learning a new game?	Overview -> Setup -> Turn Flow -> Special Rules -> End Conditions — Effective structure: Overview (what's the game?), Setup (start), Turn Flow (core loop), Special Rules (edge cases), End Conditions (when does it end?). This matches learning order.
A board has 100 spaces. If you roll a single d6 each turn, what's the FEWEST turns needed to traverse the board	17 turns (since 16 turns of 6 = 96, need 1 more) — Rolling all 6s, 16 turns covers 96 spaces. The 17th turn covers the remaining 4 spaces, so

(always rolling 6)?	17 turns minimum.
Which sentence has POOR rulebook style?	'If you want, maybe you could draw some cards or not.' — Vague, hesitant phrasing ('if you want', 'maybe', 'some') makes a rulebook unusable. Replace with direct commands: 'Draw exactly 2 cards.'

13. Cross Topic Connections

⌂ Question (fold →)	Answer
A game balance EXPRESSION: if Strategy A wins 60% and Strategy B wins 40%, what's the difference?	Strategy A wins 20 percentage points more than B — $60\% - 40\% = 20$ percentage points difference. This is a significant imbalance — Strategy A should be nerfed or B buffed.
Why do designers add SHORTCUTS to path boards?	Shortcuts add strategic decisions about risk versus reward — Shortcuts give players meaningful decisions — speed up but accept risk, or stay safe and slow. This adds strategy beyond just rolling dice.
In a game where players earn points equal to their die roll, what is the expected score per turn?	3.5 points — Average score per turn equals the expected value of the die: $(1+2+3+4+5+6)/6 = 3.5$ points.
Which feedback type is MOST useful from a playtest?	'I was confused on turn 3 when I drew an event card' — Specific feedback ('confused on turn 3 by event cards') is actionable. Vague feedback ('it was good') doesn't help the designer fix anything.
A board has 20 spaces and a 'shortcut' that skips 5 spaces. How long is the shortcut path versus the regular path between the same two points?	5 spaces shorter than the regular path — A shortcut that 'skips 5 spaces' reduces the journey by 5 spaces compared to the regular path.
A rulebook says 'Draw cards equal to your score'. A playtester scores 0 and asks 'Do I draw 0 cards?'. The rulebook should:	Explicitly state how to handle 0 — Good rulebooks explicitly handle boundary cases (0 cards, negative values, ties). Ambiguity here causes mid-game disputes. E.g., 'Draw 0 cards if your score is 0'.
Why might a game designer use a SMALLER deck (say 30 cards instead of 100)?	Smaller decks make probability swings more impactful and games shorter — A smaller deck makes each card matter more, increases the chance of seeing key cards, and typically shortens the game — all important design levers.
Why are 'BLIND PLAYTESTS' (designer absent) essential before publishing?	They reveal rulebook problems hidden when the designer can verbally clarify — When the designer is present, they unconsciously fill in rulebook gaps. Blind tests force the rulebook to stand alone — revealing what it fails to communicate.
Why do 'TIE-BREAKERS' need to be CLEARLY DEFINED in a balanced game?	Without clear tie-breakers, players argue and the game's outcome feels unfair — Clear tie-breaker rules (e.g., 'most remaining resources wins ties') prevent disputes and ensure the game has a definitive, fair outcome.
A rulebook is 30 pages with 10 pages of examples and 5 of glossary. About what fraction is core rules?	1/2 (15 of 30 pages) — $30 \text{ total} - 10 \text{ examples} - 5 \text{ glossary} = 15 \text{ pages core rules}$. $15/30 = 1/2$ of the book.
A custom deck has 24 cards. If 4 players each draw a 5-card hand, how many cards remain in the deck?	4 cards — Dealing 5 cards to 4 players uses 20 cards (4×5), leaving $24 - 20 = 4$ cards in the deck.
If 5 of 10 playtesters say a specific card	Investigate the card seriously — When half of testers spontaneously raise the same issue, it's a systemic problem, not opinion. Investigate the

is overpowered, the designer should:	card's power level and likely nerf it. — consistent feedback signals a real issue.
If a hex board is built from 7 hexes (1 center + 6 around), how many EDGES (shared sides) connect adjacent hexes?	6 — Each of the 6 outer hexes shares exactly one edge with the center hex, giving 6 adjacency edges total in this small flower pattern.
A player must roll a 5 or higher to succeed on an attack. What is the probability of success on one d6 roll?	2 out of 6 (or 1/3) — Rolling 5 or 6 are the two favorable outcomes out of 6 total faces, giving probability $2/6 = 1/3$ (about 33%).
A game has 20 attack tokens and 15 defense tokens. What's the RATIO of attack to defense tokens?	4 to 3 — 20:15 simplified by dividing both numbers by 5 gives 4:3 — there are 4 attack tokens for every 3 defense tokens.
Why might a path board LOOP (form a circle) instead of having a clear start and end?	Looping paths let players keep playing through multiple rounds without resetting — Looping paths (like Monopoly) allow the game to continue indefinitely as players go around, accumulating resources or losses on each pass, instead of a fixed end.
Why is a 'QUICK START GUIDE' valuable alongside a full rulebook?	Players can learn the basics fast and reference the full rules later for details — A quick start guide teaches the essentials in 1-2 pages, getting players playing fast. The full rulebook supports them with details as needed.
Why does a rulebook often include EXAMPLES with illustrations?	Examples show how rules apply in practice, clarifying abstract instructions — Examples (especially illustrated ones) demonstrate how rules play out, helping players understand abstract instructions through concrete scenarios.
In a Monte Carlo simulation of dice combat, the attacker wins 60%. With 4 attackers and 3 defenders, this means:	Attackers usually win these fights — a built-in attacker advantage — A 60% attacker win rate gives offense the edge. Designers must decide if this asymmetry is intended (favoring aggression) or needs balancing.
If you have a deck of 20 cards (10 red, 10 blue), what is the probability of drawing a RED card?	1 out of 2 (or 50%) — 10 favorable cards (red) out of 20 total gives probability $10/20 = 1/2$ or 50%.
If a designer makes the FIRST PLAYER pay 1 extra resource per turn, this is BALANCING by:	Adding a cost to the first-player slot to offset the advantage — Adding costs to the advantaged position balances the game: first player keeps the move advantage but pays for it, evening expected outcomes.
A game uses score tokens worth 1, 5, and 10 points. To make 27 points using the FEWEST tokens, you'd use:	2 ten-tokens + 1 five-token + 2 one-tokens = 5 tokens — Using the largest denominations first: 2 tens (20) + 1 five (25) + 2 ones (27) = 5 tokens total, the minimum.
Why are GAME PIECES often made of WOOD or PLASTIC instead of paper?	Durability — wood and plastic survive many plays without damage — Wood and plastic resist bending, tearing, and warping over hundreds of plays, while paper degrades quickly. The cost is balanced against longevity.
Which board layout is BEST for a game with 'territory control' as the main mechanic?	Freeform or hex — Territory control games need clearly defined regions to capture, which hex maps (Catan-style) or freeform region maps (Risk-style) provide naturally.
A balanced 5-player game should have each player winning approximately	1/5 (20%) — Five equally-balanced players should each win about 1/5

what fraction of games?

(20%) of games. Significant deviation indicates imbalance.

14. Real World Board Game Careers

⌘ Question (fold →)	Answer
Which board layout BEST encourages players to spread out and explore?	Large hex or freeform board with multiple regions — Large hex or freeform boards offer many regions and routes, encouraging exploration and spreading players apart, while small or linear boards crowd them.
On a 5x5 grid board, how many total squares are there?	25 — A 5-row by 5-column grid has $5 \times 5 = 25$ squares total.
If 5 of 10 playtesters say a specific card is overpowered, the designer should:	Investigate the card seriously — When half of testers spontaneously raise the same issue, it's a systemic problem, not opinion. Investigate the card's power level and likely nerf it. — consistent feedback signals a real issue.
Why do most card games have HIDDEN HANDS instead of face-up hands?	Hidden information creates strategy, bluffing, and uncertainty — Hidden hands create information asymmetry — players must plan based on incomplete information, enabling bluffing, prediction, and deeper strategy.
If 6 players need 8 cards each for setup, but the deck has 50 cards, what's the smallest deck size needed?	48 cards minimum — $6 \text{ players} \times 8 \text{ cards} = 48 \text{ cards}$ needed for setup. The 50-card deck is sufficient with 2 cards spare.
Which is NOT a use of probability simulation in game design?	Deciding what art style to use — Simulations excel at numerical questions (win rates, game length, card frequency). Art style is a creative/aesthetic decision, not a statistical one.
Why would a designer use a FREEFORM map (like Risk) instead of a regular grid?	Freeform maps create thematic regions and unique strategic geography — Freeform maps (countries, planets, dungeons) match thematic content and create unique geographic features (peninsulas, chokepoints, oceans) that drive strategic identity.
A designer wants to know 'how often does the game last over 60 minutes?'. Best approach?	Simulate 10,000 game lengths and count how many exceed 60 minutes — Simulating 10,000 game lengths and counting how many exceed 60 minutes gives a reliable estimate of the long-game probability.
'CATCH-UP MECHANICS' that are TOO STRONG cause what problem?	Leading players feel punished for playing well — winning becomes pointless — Overly strong catch-up systems make winning early pointless because leaders are constantly knocked back. Good design helps laggards compete without punishing skill.
A player must roll a 5 or higher to succeed on an attack. What is the probability of success on one d6 roll?	2 out of 6 (or 1/3) — Rolling 5 or 6 are the two favorable outcomes out of 6 total faces, giving probability $2/6 = 1/3$ (about 33%).
Why do MODERN board games like 'Pandemic' or 'Wingspan' rely on simulation for design?	Their complex systems have too many variables to balance by intuition alone — Complex modern games involve thousands of card interactions and edge cases that human intuition can't fully evaluate. Simulation reveals systemic imbalances early.
Why does a rulebook often include EXAMPLES with illustrations?	Examples show how rules apply in practice, clarifying abstract instructions — Examples (especially illustrated ones) demonstrate how rules play out, helping players understand abstract instructions through concrete

	scenarios.
In a player-vs-player dice duel, each player rolls 1d6 and the higher number wins. What's the probability of a tie?	6 out of 36 (or 1/6) — There are 6 tie outcomes (both rolling 1, both rolling 2, ... both rolling 6) out of 36 total pairs, giving probability $6/36 = 1/6$.
A playtest finds the game takes 90 minutes when targeting 30 minutes. The designer should:	Identify what slows the game and trim or simplify it — Triple the target length signals the game is too complex. The designer identifies slow phases or unnecessary mechanics and trims them.
If 90% of testers say setup is 'too long', the BEST response is:	Find ways to shorten or simplify setup — Overwhelming consensus (90%) signals a real issue. Long setup discourages players from getting the game to the table. Designers should simplify setup aggressively.
If a game ASSUMED a strategy wins 50% but simulation shows 70%, what should the designer DO?	Investigate why the simulation differs and likely adjust the strategy's cost or power — When simulation contradicts assumptions, trust the data. A 20-point gap suggests the strategy is undervalued in the model — investigate and rebalance.
If a player rolls a 20-sided die (d20), what is the probability of rolling exactly 15?	1 out of 20 — A d20 has 20 faces numbered 1-20. Each face has probability $1/20$, so rolling exactly 15 is $1/20$.
Why are RULEBOOKS often printed in MULTIPLE LANGUAGES for international games?	To make the game accessible to players in different countries without translation costs — Multi-language rulebooks let publishers sell the same physical product in multiple countries, reducing manufacturing costs and serving diverse players.
A rulebook says 'Draw cards equal to your score'. A playtester scores 0 and asks 'Do I draw 0 cards?'. The rulebook should:	Explicitly state how to handle 0 — Good rulebooks explicitly handle boundary cases (0 cards, negative values, ties). Ambiguity here causes mid-game disputes. E.g., 'Draw 0 cards if your score is 0'.
Why is it BAD if a game's win rate depends mostly on TURN ORDER?	Players feel the game is decided by luck of the draw rather than skill — If turn order determines wins, player choices feel meaningless and skill cannot overcome a bad seat. This frustrates players and undermines replayability.
Why might a game designer choose to use a 'd4' (4-sided die) instead of a 'd6'?	To narrow the range of outcomes and reduce variance — A d4 produces 1-4 instead of 1-6, narrowing the range so results are more predictable. Designers pick die sizes to tune randomness vs. predictability.
Why do designers test EARLY and OFTEN rather than waiting until the design feels 'done'?	Problems are easier to fix early; major issues found late require huge rework — Early playtesting catches structural problems when they are cheap to fix (a paper change). Waiting until 'done' means rework on art, components, and rules all at once.
Why might a path board LOOP (form a circle) instead of having a clear start and end?	Looping paths let players keep playing through multiple rounds without resetting — Looping paths (like Monopoly) allow the game to continue indefinitely as players go around, accumulating resources or losses on each pass, instead of a fixed end.
Which sum is MOST likely when rolling two 6-sided dice?	7 — Seven has the most combinations (1+6, 2+5, 3+4, 4+3, 5+2, 6+1) — six ways out of 36, more than any other sum.
How many total outcomes are possible when rolling two 6-sided	36 — Each die has 6 outcomes independently, so two dice produce $6 \times 6 = 36$

dice?

ordered outcomes.

15. Misconceptions And Reasoning

⌕ Question (fold →)	Answer
Simulations use 'PSEUDORANDOM' numbers. Why?	Computers generate numbers that LOOK random but follow a formula — good enough for simulations — Computers use pseudorandom number generators — mathematical formulas that produce sequences with random-like statistical properties. They're sufficient for simulations.
Why is rolling two dice and adding them DIFFERENT from rolling one die twice as fast?	Two dice produce a bell-curve of sums, while one die produces equally likely outcomes — Two-dice sums favor the middle (7 is most common); a single die has uniform probability for every face. The shape of the distribution differs completely.
What is a 'DOMINANT STRATEGY'?	A strategy that is always better than other strategies, ruining game choices — A dominant strategy outperforms all others regardless of the situation. Its existence makes the game boring because choices stop mattering — balance fails.
In a 2-player abstract game like Hex, what does the 'PIE RULE' do?	Player 2 can choose to swap sides after seeing Player 1's first move, neutralizing first-player advantage — The pie rule: after Player 1 makes the first move, Player 2 can either play normally OR swap sides. This forces Player 1 to make a 'fair' opening, balancing the game.
Which is the MOST important consideration when sizing tokens for a board game?	Tokens must fit comfortably on board spaces without overlapping — Tokens must fit on the board spaces they're placed on, ideally with room for multiple if the game allows stacking, without overlapping illegibly.
What is a HEX board's main advantage over a square grid?	Each space has 6 equidistant neighbors instead of 4, allowing more natural diagonal movement — Hexagonal spaces have 6 neighbors all the same distance away, unlike squares where diagonal neighbors are farther than orthogonal ones. This makes movement and ranges feel more natural.
Why do board games SHUFFLE the deck between rounds?	To randomize card order so future draws are unpredictable — Shuffling randomizes card order so players cannot predict what will be drawn next, keeping gameplay fair and uncertain.
Why is it BAD to change MANY things AT ONCE between playtests?	You can't tell which change caused which effect — Changing multiple things at once makes it impossible to attribute observed effects to specific changes. Change one or two things per playtest cycle for clean analysis.
Which board layout BEST encourages players to spread out and explore?	Large hex or freeform board with multiple regions — Large hex or freeform boards offer many regions and routes, encouraging exploration and spreading players apart, while small or linear boards crowd them.
A deck of 25 cards has 5 'win' cards. After drawing a win card without replacement, what's the probability the NEXT draw is also a win?	4 out of 24 — After removing one win card, 4 wins remain in 24 cards, so the next draw has probability $4/24 = 1/6$.
Why might a game designer use a SMALLER deck (say 30 cards instead of 100)?	Smaller decks make probability swings more impactful and games shorter — A smaller deck makes each card matter more, increases the chance of seeing key cards, and typically shortens the game — all important design levers.

If 5 of 10 playtesters say a specific card is overpowered, the designer should:	Investigate the card seriously — When half of testers spontaneously raise the same issue, it's a systemic problem, not opinion. Investigate the card's power level and likely nerf it. — consistent feedback signals a real issue.
What is the PRIMARY GOAL of a board game rulebook?	To let players learn and play the game without outside help — A rulebook's primary purpose is to teach the game completely — players should be able to set up, play, and resolve every situation using only the rulebook.
Why do designers add SHORTCUTS to path boards?	Shortcuts add strategic decisions about risk versus reward — Shortcuts give players meaningful decisions — speed up but accept risk, or stay safe and slow. This adds strategy beyond just rolling dice.
What does 'GAME BALANCE' mean?	All players have a fair chance to win regardless of starting position or choices — Game balance means every player has a fair chance to win — no single strategy, character, or starting position dominates.
In a 100-game playtest, Character A wins 65 times. What does this suggest?	Character A may be overpowered and need a nerf — If 4 characters were balanced, each should win about 25% (25 of 100 games). A character winning 65% strongly suggests it is overpowered and needs adjusting.
If theoretical probability of an event is 0.25 and your simulation shows 0.30 after 100 trials, what should you do?	Run more trials — 100 is too few to converge — Small samples (100 trials) have high variance — a 5-point gap is normal. Run thousands of trials before suspecting a model error.
What does 'CONSISTENT TERMINOLOGY' mean in a rulebook?	Using the same word for the same concept throughout — not switching between synonyms — Consistent terminology means using the same word for the same thing every time. Switching between 'token', 'piece', and 'marker' confuses players about whether they're the same.
What is 'OBSERVER MODE' playtesting?	Watching players play without intervening, to see where the game itself struggles — In observer mode, the designer watches silently as players figure things out. This reveals whether the rulebook and game communicate clearly without designer help.
'NERFING' a game element means:	Reducing its power to balance the game — Nerfing means weakening an overpowered element — lowering damage, raising cost, restricting use — to bring it in line with other options.
What is 'FIRST-PLAYER ADVANTAGE'?	The benefit one player gets simply by going first — First-player advantage is the statistical edge of going first — more turns, first picks, or first access to resources. Chess, for example, slightly favors White.
In a player-vs-player dice duel, each player rolls 1d6 and the higher number wins. What's the probability of a tie?	6 out of 36 (or 1/6) — There are 6 tie outcomes (both rolling 1, both rolling 2, ... both rolling 6) out of 36 total pairs, giving probability $6/36 = 1/6$.
What is the SUM of probabilities for all possible outcomes on a fair die?	1 (or 100%) — The probabilities of all possible outcomes must sum to 1 because something must happen. Six faces at $1/6$ each gives $6/6 = 1$.
Why does 'TRIAL INDEPENDENCE' matter in simulation?	Each trial should not depend on previous trials, or the experimental probability will be biased — Independent trials let results aggregate correctly into probabilities. If trials affect each other (carry-over), the experimental probability misrepresents true gameplay.

Why should rulebooks use
'NUMBERED STEPS' for setup?

Numbered steps prevent missed actions and make order clear —

Numbered steps create a clear, sequential checklist players can follow without missing or reordering critical setup actions.

16. Advanced Synthesis

⌂ Question (fold →)	Answer
Why are 'PLAYER AID CARDS' helpful in addition to the rulebook?	Quick references summarize core actions without rereading the full rules — Player aid cards summarize each turn's options on a small card players keep at hand, eliminating constant rulebook checks during play.
Which is the BEST rule for handling EDGE CASES (rare or unusual situations)?	List them clearly in a 'Special Cases' section near the relevant rules — Document edge cases in a labeled section so players can find resolutions without searching. Hiding them leads to mid-game disputes.
In a 100-game playtest, Character A wins 65 times. What does this suggest?	Character A may be overpowered and need a nerf — If 4 characters were balanced, each should win about 25% (25 of 100 games). A character winning 65% strongly suggests it is overpowered and needs adjusting.
If a rule has MULTIPLE INTERPRETATIONS, the designer should:	Rewrite the rule to remove ambiguity — Ambiguous rules cause disputes. The designer's job is to rewrite until only one interpretation is possible.
Why might a designer choose a HEX board for a tactical war game?	Equal distances in 6 directions make tactical positioning feel fair — Hex boards give all 6 neighbors equal distance, so attack ranges and movement feel uniformly fair in all directions — important for tactical wargames.
A simulation shows Card A is drawn in 80% of games. What does this tell the designer?	Card A appears too often and may dominate strategies — If a card appears in 80% of games, it heavily shapes strategy. Designers may want to reduce its frequency to encourage variety and surprise.
Why is it BAD to change MANY things AT ONCE between playtests?	You can't tell which change caused which effect — Changing multiple things at once makes it impossible to attribute observed effects to specific changes. Change one or two things per playtest cycle for clean analysis.
Why do designers playtest with the GAME'S TARGET AGE GROUP (e.g., 9-14 year olds for kid games)?	Younger or older testers have different comprehension and tastes; you must test with the actual audience — Adults may breeze through rules that confuse kids, and vice versa. Testing with the actual target audience reveals real-world reception — adult-only testing gives misleading data.
Why might a game designer use a SMALLER deck (say 30 cards instead of 100)?	Smaller decks make probability swings more impactful and games shorter — A smaller deck makes each card matter more, increases the chance of seeing key cards, and typically shortens the game — all important design levers.
If a game says 'roll 2 dice and add them', which sum is LEAST likely?	2 (or 12) — Only one combination produces 2 (1+1) and only one produces 12 (6+6), making these the rarest sums at 1/36 each.
If a playtester quits the game halfway through, this likely means:	The game is failing to engage them — When players abandon a game mid-play, the game lost their engagement. Designers should investigate where engagement collapsed (boring phase, snowball loss, too long). — investigate why immediately.
Which board layout BEST encourages players to spread out and explore?	Large hex or freeform board with multiple regions — Large hex or freeform boards offer many regions and routes, encouraging exploration and spreading players apart, while small or linear boards crowd them.
Why is it BAD if a game's	Players feel the game is decided by luck of the draw rather than skill — If turn

win rate depends mostly on TURN ORDER?	order determines wins, player choices feel meaningless and skill cannot overcome a bad seat. This frustrates players and undermines replayability.
If a game uses 'COINS' worth 1, 3, and 10, and a player has 1 of each, what total can they NOT make?	5 (or 6, 7, 8, 9 — anything between 4 and 10) — Possible sums: 1, 3, 4 (1+3), 10, 11 (10+1), 13 (10+3), 14 (10+3+1). Numbers 2, 5, 6, 7, 8, 9, 12 cannot be made.
On a 10x10 grid board, how many EDGE squares (along the border) are there?	36 — Edge squares: 10 (top) + 10 (bottom) + 8 (left, minus corners already counted) + 8 (right, minus corners) = 36 border squares.
How does GOOD TYPOGRAPHY help a rulebook?	Headings, bullet points, and bold key terms make scanning easy — Clear headings, bullet points, and bolded key terms create visual hierarchy. Players can scan to find the rule they need without reading every word.
Which sentence has POOR rulebook style?	'If you want, maybe you could draw some cards or not.' — Vague, hesitant phrasing ('if you want', 'maybe', 'some') makes a rulebook unusable. Replace with direct commands: 'Draw exactly 2 cards.'
Why might a designer use a 'CUSTOM DIE' (with symbols instead of numbers)?	Symbols can directly show game outcomes (attack, defend, special) without translation — Custom symbol dice (skulls, shields, swords) communicate outcomes directly — players don't have to look up what 'rolled a 4' means. This speeds up play and adds theme.
Why do most card games have HIDDEN HANDS instead of face-up hands?	Hidden information creates strategy, bluffing, and uncertainty — Hidden hands create information asymmetry — players must plan based on incomplete information, enabling bluffing, prediction, and deeper strategy.
Why do MODERN board games like 'Pandemic' or 'Wingspan' rely on simulation for design?	Their complex systems have too many variables to balance by intuition alone — Complex modern games involve thousands of card interactions and edge cases that human intuition can't fully evaluate. Simulation reveals systemic imbalances early.
Which sentence is MOST AMBIGUOUS?	'Players may use cards when it's appropriate.' — 'When it's appropriate' is fully subjective — every player will interpret it differently. The others give precise instructions with measurable conditions.
Why do 'TIE-BREAKERS' need to be CLEARLY DEFINED in a balanced game?	Without clear tie-breakers, players argue and the game's outcome feels unfair — Clear tie-breaker rules (e.g., 'most remaining resources wins ties') prevent disputes and ensure the game has a definitive, fair outcome.
Why is 'PERFECT BALANCE' often considered an UNREACHABLE goal?	Even tiny differences in strategy or skill change effective win rates — Real games have many interacting variables and skill differences. Designers aim for 'balanced enough' — strategies viable at competitive play, not mathematically equal.
Why should COLORBLIND PLAYERS be considered when choosing token colors?	Red-green colorblindness is common; using shape or icons in addition to color helps — About 1 in 12 men and 1 in 200 women have color vision deficiency. Distinguishing pieces by shape or pattern in addition to color makes games inclusive.
Why are 'BLIND PLAYTESTS' (designer absent) essential before publishing?	They reveal rulebook problems hidden when the designer can verbally clarify — When the designer is present, they unconsciously fill in rulebook gaps. Blind tests force the rulebook to stand alone — revealing what it fails to communicate.

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