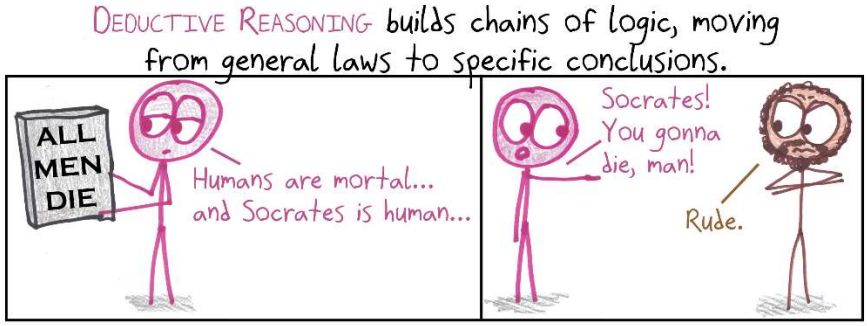
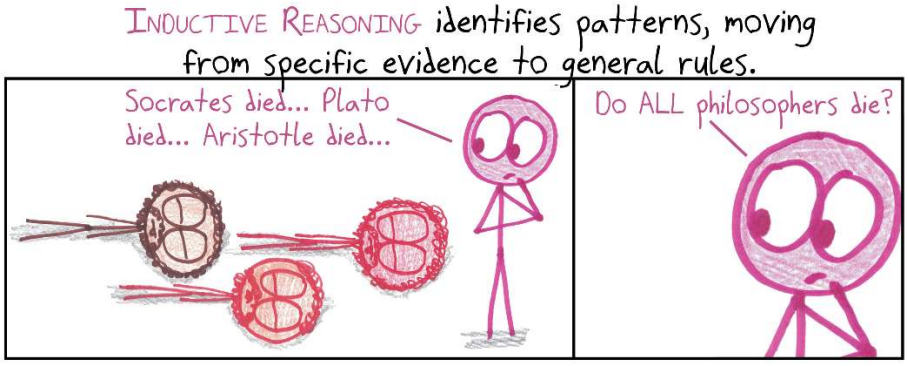
Saesara

A Game of Induction

Time for a quick vocabulary lesson. First, **deductive reasoning**:



Second, **inductive reasoning**:



Now, comprehension check: Which kind of reasoning do most games promote?

The answer is “deductive.” We know the rules of chess from the outset, and the strategic challenge lies in applying them to new situations. By contrast, inductive games—where you seek to ferret out unknown rules—well, those are rare. Not only rare, but special. Not only special, but a riveting model of scientific inquiry. And not only a riveting model of scientific inquiry… but pretty darn fun, too.

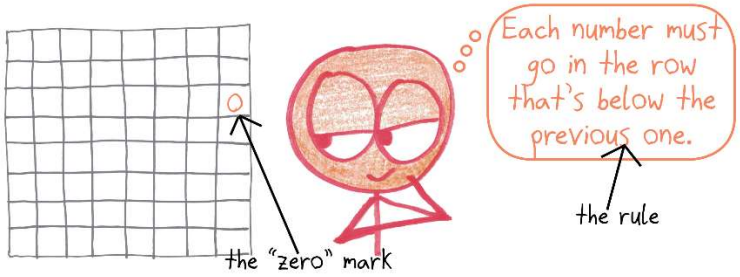
How to Play Saesara

What do you need? Three to five players, each with a pen or pencil. Also, for each round, an 8-by-8 grid with amply sized squares.

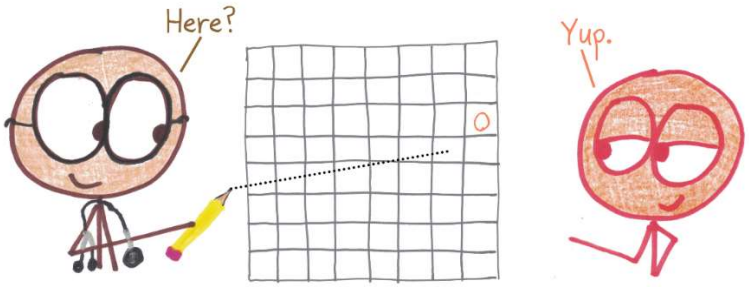
What’s the goal? Figure out the secret rule for placing numbers.

What are the rules?

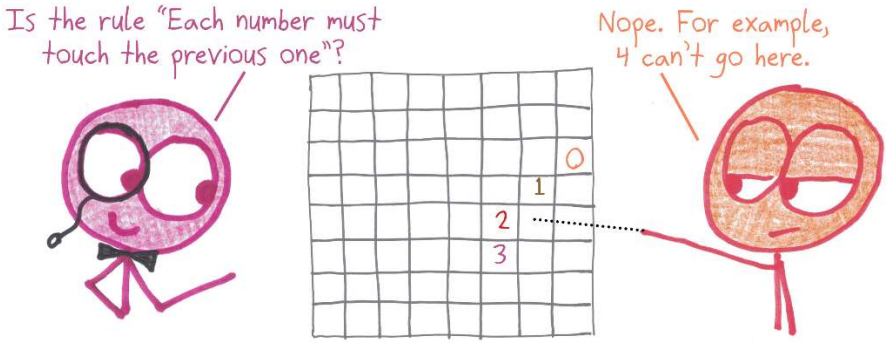
1. To begin the round, one player—**the Patternmaker—comes up with a secret rule for writing numbers on the grid**. They may also choose to start the game with **a "zero" mark** (noting that some rules require a "previous" mark to play off of).



2. Other players then take turns attempting to place marks by pointing a pencil at a square and asking the Patternmaker, **"May I place a number here?"** If the Patternmaker says "yes," **write the next number**. If the Patternmaker says "no," don't write anything.

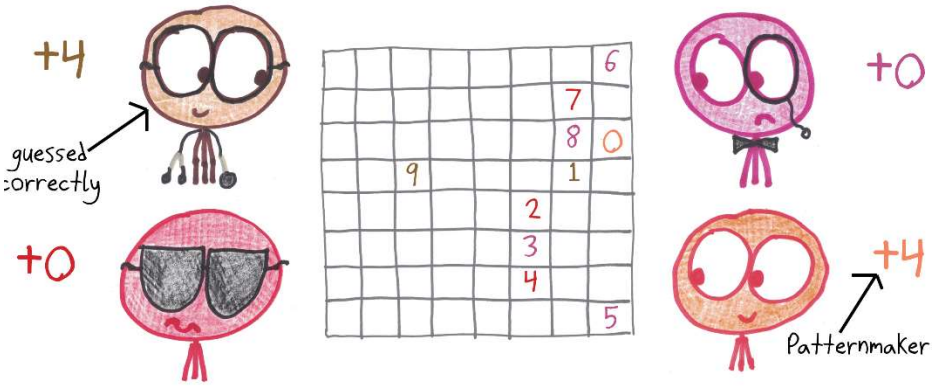


3. On any turn, after trying to place a number, you may also **try to guess the rule**. If you're wrong, **the Patternmaker must demonstrate**, by showing either (A) an allowed move that your rule would have forbidden, or (B) a forbidden move that your rule would have allowed. No other hints or feedback are permitted.[1]

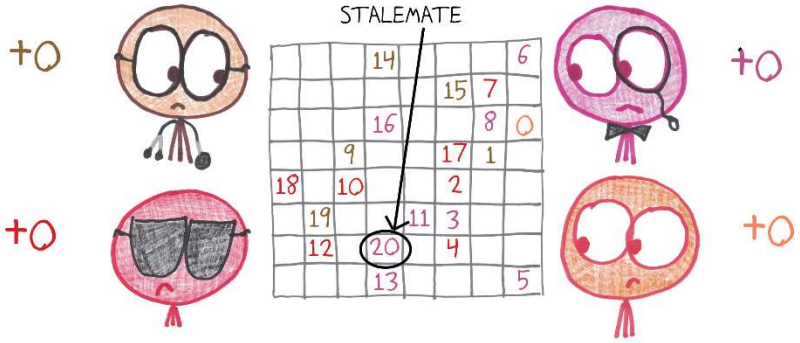


[1] If necessary, the Patternmaker may cite counterexamples from the past ("Your rule would have forbidden a number here, but look, we already placed one") or the future ("Your rule works for the *next* number, but it doesn't apply to the number after; see, here's a counterexample"). But if a rule correctly describes all past turns, and correctly predicts all future ones, then it's the correct rule, even if it's not phrased as the Patternmaker imagined.

4. If **you guess the rule correctly,** then the round ends. Divide the highest number on the grid by two (rounding down if necessary), and give this number of points to **both the correct guesser and to the Patternmaker**.



5. However, the round can end in other ways: (1) **if the board reaches the number 20 without the rule being guessed**; (2) **it becomes impossible to place any more numbers**; or (3) **one guesser says "Should we give up?" and the others all agree**. In any such case, the round is considered a stalemate, and **everyone scores zero**.



6. Play until everyone has had **one turn each as Patternmaker** (or, if you prefer, two turns each). Highest total score wins.

Notes on Rule Design

I can't emphasize this enough: **make your rule guessable**. Your turn as Patternmaker is a great chance to score points, and that's wasted on a stalemate. Rules should not be too complex, too weird, too restrictive (lest you run out of legal moves), or too permissive (lest you reach 20 marks without a successful guess.) Remember that **rules are always, always, *always* harder to guess than you'd expect**.

All that said, your rule can include any combination of these factors[2]:

- **Board Geography**. E.g., "If the grid were colored like a checkerboard, then you may only place numbers on the black squares."
- **The Number Itself**. E.g., "Odd numbers on the top half of the board; even numbers on the bottom half."
- **The Previous Number**. E.g., "Each number must be in a different row and column that the previous number."
- **All Previous Numbers**. E.g., "Each number must be touching exactly one previous number."

Tasting Notes

In Saesara, players collaborate to gather data, hoping to uncover a rule that governs and explains everything they've seen, just like science at its best. Also, only one person can get credit, just like science at its not-best.

How do you stay ahead of your competitors? Well, remember that guessing the rule isn't just a chance to win the game. It's a chance to gather information. Proposing a rule like "you can't go anywhere" will force the Patternmaker to show you a valid move. Meanwhile, guard your hunches carefully: guessing a rule that's almost but not quite right could hand the round to your opponent. It's safer to test your hypothesis a few times before venturing a public guess.

As for the Patternmaker, you are a scientific law that wants to be found, but not too quickly. How do you manage that trick?

Well, when a player guesses an incorrect rule, calibrate your feedback. Early on, to drag the round out, give minimally informative counterexamples, Later, to avoid stalemate, give maximally informative counterexamples, ones that highlight your rule's essential features.

Where It Comes From

Saesara emerges from a distinguished family tree of "guess the rule" inductive games. Its great-grandparent is Robert Abbott's 1956 card game "Eleusis," in which you attempt to uncover the dealer's rule for which cards are playable. Abbott's game hatched several offspring, including John Golden's nifty, Abbott-endorsed "Eleusis Express"; Sid Sackson's Patterns II; Kory Heath's "Zendo" (the masterwork of the genre); and Saesara's most direct ancestor, Eric Solomon's pencil-and-paper game that he confusingly called "Eleusis." I've reworked the scoring, switched

[2] I recommend against rules based on invisible factors, such as who placed the number, or whether that square has been tried before. But sufficiently expert players may ignore this advice, as they tend to do with all advice.

letters for numbers, and turned it from a game of mark-placing into one of rule-guessing. That feels like enough changes to justify a new name. To stick with the theme, I've chosen "Saesara," the ancient name of the Greek city of Eleusis.

Variations and Related Games

SPEED SAESARA. Play on a **6-by-6** board, and lower the **stalemate threshold to 10**. It's a faster game that pressures Patternmakers into easier rules.

GRAND SAESARA. Play on a **10-by-10 board,** and raise the **stalemate threshold to 30**. A longer, slower game, allowing for more mysterious and complex rules. Beginners beware!

JEWELS IN THE SAND: For 2 to 8 players, this is the simplest (and perhaps the most elegant) inductive game around. One player, the Judge, makes up a **secret rule for distinguishing jewels vs. sand**. The Judge then provides the other players with the following information:

1. The **category** of objects to classify (e.g., numbers)
2. An **example jewel** (e.g., 2000)
3. An **example of sand** (e.g., 7)

On your turn, name an object, and **ask either "Is it a jewel?" or "Is it sand?"** If the judge says **"yes," then you keep asking questions**. If the judge says "no," then your turn ends.

At any point during your turn, **you may attempt to guess the rule** (e.g., "Numbers 100 and up are jewels; numbers below 100 are sand"). If you're wrong, then the Judge demonstrates by giving a counterexample (e.g., "12 is a jewel" or "9,999 is sand"), and your turn ends. If you're right, then you win, and **serve as Judge for the next round**.

Some suggestions from Andy Juell, suited to pretty much any class in school:

- **Chemistry:** Mercury and bromine are jewels; iron and helium are sand.
- **English Literature:** 'Quickly,' 'yesterday,' and 'here' are jewels; 'myself,' 'bicycle,' and 'green' are sand.
- **History:** Fort Sumter and Pearl Harbor were jewels; Gettysburg and Midway were sand.
- **Music:** D and G major are jewels; C and F major are sand.