

ENTROPIC
PUZZLES

Born Solved

Information Package

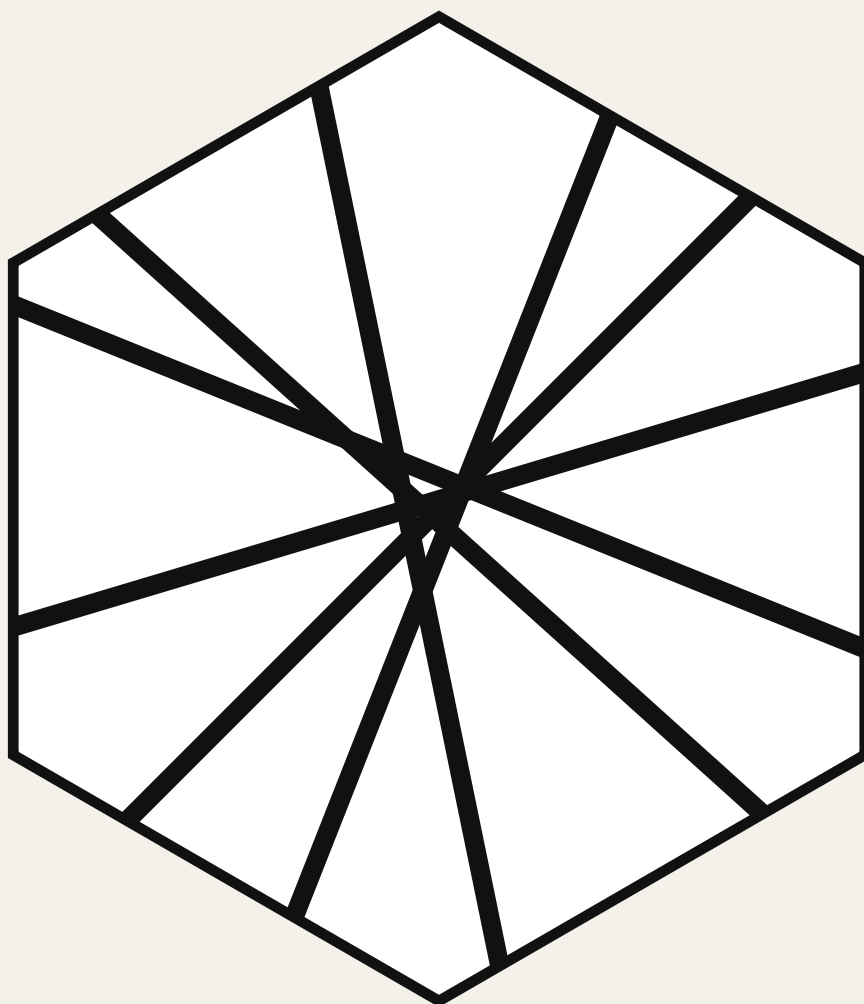
What it is · How it works · The mathematics · Why it is hard

Written in Entropic Notation. Manufactured in the born state. Scrambled before sale.

1 · What Born Solved is

Born Solved is an edge-matching puzzle made from identical-looking hexagonal pieces. Plain black lines cross each edge; where two pieces meet, those lines must continue without interruption.

There is no picture, border, corner, distinguishable top or bottom, or printed label. Every copy is manufactured as one solved sheet before being cut apart and scrambled. The arrangement in which it was manufactured is the *born state*, a known answer that can be reproduced from the puzzle seed.

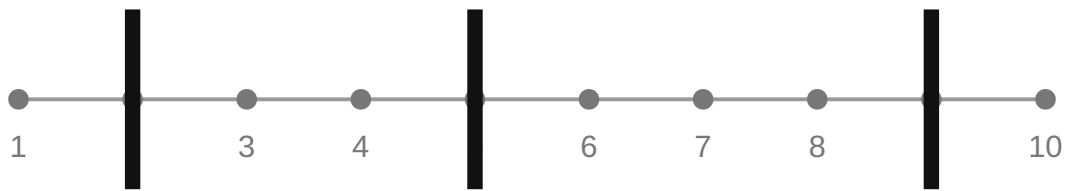


A single Born Solved piece. The markings are visible; the placement is not.

2 · Entropic Notation

Entropic Notation encodes information by position. Fixed locations along every edge are called **stations**. A **letter** is the choice of stations crossed by visible lines. The stations themselves are never printed.

One edge, ten stations



The stations are not printed. Only the line crossings are visible.

The alphabet

The complete set of letters used by a puzzle is its alphabet. Letters are distributed evenly so that rare markings do not create easy anchors. The alphabet is mirror-balanced so that flipping a piece changes its reading into other legal letters.

3 · The born state and the seed

The born state is the arrangement in which the puzzle was manufactured. It is not publicly claimed to be the only possible solution. Any complete arrangement in which every line connects is a valid solve.

Each puzzle is generated from a 256-bit seed. The same seed and generator reproduce the identical design. The seed is therefore both a compact description of the puzzle and its answer key. Seeds and proprietary tuning parameters are not published.

Precise language: arrangements are not the same as possible solutions. The born state is the known manufactured answer.

4 · The mathematics

The raw number of arrangements is:

$$A = n! \times 12^n$$

The factorial counts ways to place the pieces. The power of twelve counts six rotations on either face.

$$\approx 10^{15}$$

3×3 · 9 pieces

$$\approx 10^{158}$$

8×8 · 64 pieces

$$\approx 10^{783}$$

16×16 · 256 pieces

$$\approx 10^{3745}$$

32×32 · 1,024 pieces

These figures describe the raw arrangement space. They do not, by themselves, prove practical solver hardness.

5 · How hardness is measured

A huge arrangement space is not enough. Modern SAT solvers reason, learn from conflicts and prune enormous parts of a search. Difficulty therefore has to be tested empirically.

Earlier Kissat runs established a sharp rise in difficulty as puzzle size increased. The benchmark programme is now being expanded with CaDiCaL. The revised dataset will report puzzle size, encoding version, variables, clauses, solver version, hardware, time limit, elapsed time, result, conflicts, decisions, propagations, restarts and peak memory.

Publication rule: measured data, timeouts, raw arrangement counts and any extrapolation will be shown separately. The revised hardness curve will be published only after the expanded runs have been checked.

6 · Scanning and modelling

Scanning a piece reveals its lines perfectly. That does not reveal where the piece belongs. The challenge is placement, orientation and compatibility across the entire grid.

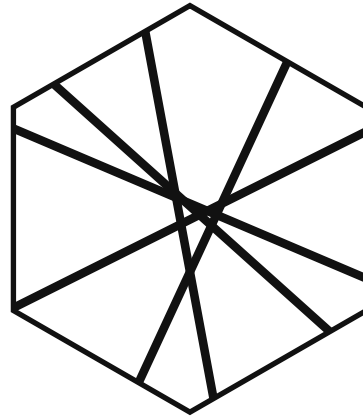
Modelling the puzzle in software is useful because it permits rigorous attack by SAT solvers, but it does not remove the search problem. The only direct shortcut to the manufactured born state is possession of the original seed.

7 · Comparison with Eternity II

Whole symbols versus positional notation



Whole symbol per edge



Same ink, position carries the code

Feature	Eternity II	Born Solved 16×16	Born Solved 32×32
Pieces	256	256	1,024
Shape	Square	Hexagon	Hexagon
Constraints	480	705	2,945
Orientations	4	12	12
Border	Yes	None	None
Fixed clues	Yes	None	None
Raw space	$\approx 10^{500}$	$\approx 10^{783}$	$\approx 10^{3745}$

8 · Planned product range

8×8 · 64 pieces

The entry edition, already beyond the smallest experimental sizes.

16×16 · 256 pieces

The standard edition, directly comparable in piece count with Eternity II.

32×32 · 1,024 pieces

The flagship, intended as a collector object and a physical monument to combinatorial explosion.

9 · Audience

Born Solved is aimed at competitive solvers, serious collectors, the mathematically curious and high-end gift buyers who want a genuine adversary rather than a picture to assemble.

10 · Glossary

Alphabet: the set of letters used by a puzzle.

Born state: the known arrangement in which the puzzle was manufactured.

CaDiCaL / Kissat: high-performance SAT solvers used to attack encoded puzzle instances.

Conflict: a point at which the solver proves a partial assignment impossible.

Entropic Notation: positional encoding based on line crossings at stations.

Letter: a selection of stations crossed by visible lines.

Seed: the 256-bit value that regenerates a puzzle exactly.

Station: a fixed invisible reference position along an edge.

Born solved. Never restored. Good luck.

© Entropic Puzzles 2026. This package contains no seeds, anti-counterfeit methods or proprietary tuning parameters.