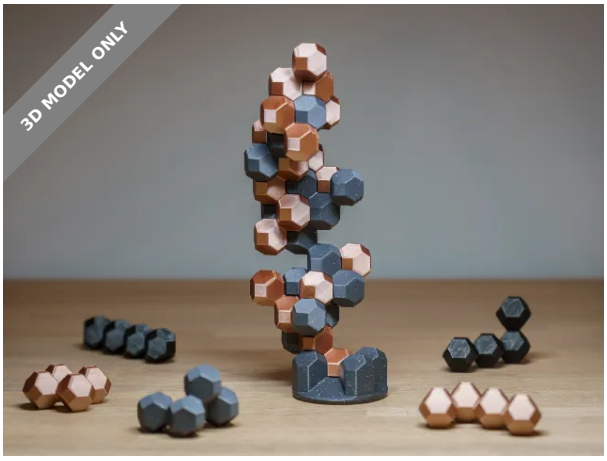


HedronStack (3D balance/stacking game)

LaisVoon

VIEW IN BROWSER

updated 7. 2. 2026 | published 7. 2. 2026

Summary

Build as high as possible by balancing/stacking pieces of truncated octahedrons.

Toys & Games > Puzzles & Brain-teasers

Tags: toy 3d puzzle game kids balance fun stackable boardgame construction stacking stack archimedes family polyhedron filling brainteaser polyhedra adult truncated octahedron balancing hedron hedronstack

This is a stacking game where players carefully place complex 3D pieces onto a growing structure, judging alignment, weight distribution and stability. While the goal is to build higher than your opponents, pushing the structure too far can cause a collapse—and instant defeat.

The game is built around the truncated octahedron, an Archimedean solid and a space-filling polyhedron. This shape can completely fill 3D space by repeating copies of itself placed face-to-face, forming a honeycomb pattern. As players stack the pieces, they discover how these shapes fit together in three dimensions.

HedronStack may look intuitive, but understanding how the pieces interact can take a few tries. Early games focus on understanding how the pieces align and support each other; once this clicks, decision-making becomes more strategic and deliberate. The game scales naturally with experience, and difficulty can be adjusted by changing the base size and number of pieces.

Contents

- 8 unique, stackable pieces make a set, each composed of four interconnected truncated octahedrons arranged in distinct configurations
- 4 base options, depending on player count and play mode
    - For 1–2 players: use the small base (HedronStack-Base-Small)
    - For 3-4 players: use the medium base (HedronStack-Base-Medium)
    - For 5 or more players: use the large base (HedronStack-Base-Large)
    - Optional expandable base: a base with many starting positions that offers more freedom in piece placement, more structural stability, and is ideal for creative builds (HedronStack-Base-Expandable)

Optional extras

- Pentacells expansion contains additional 29 unique pieces, each composed of **five** interconnected truncated octahedrons arranged in distinct configurations.
- Confounders remix for even more pieces.

Rules

There should be an equal amount of each piece. Ideally, the number of full piece sets should scale with the number of players. 2 players – 2 sets, 3 players – 3 sets, etc. In addition, each player should have their own individually colored set, which helps differentiate whose piece is placed highest. If multiple colored sets are not available, players can mix all available pieces into a single pool and draw from it; players should then pay close attention to whose piece is placed highest.

At the start of the game, players randomly draw two pieces. Players then take turns placing one piece onto the structure, ensuring it aligns with adjacent truncated octahedrons. Alignment means placing a piece so that any sides touching other pieces line up evenly and sit flush, with no spaces between them. When placing a piece, the player must not touch

any other pieces except the one being placed. After successfully placing a piece, the player draws a new piece at random, if any remain.

When placing the first piece of the game, at least one of its truncated octahedrons must fit securely into a starting concave slot on the base. The small base has a single central slot, the medium base has four starting slots and the large base has eight.

Multi-player mode

The goal is for a player to have one of their pieces reach the highest point before the structure collapses or all pieces are used. If multiple pieces reach the same maximum height, the player who placed the most recent piece at that height wins. The player whose turn causes the structure to collapse always loses, even if their earlier placed piece would have been the highest.

Single-player mode

In single-player mode, any new piece must match or exceed the maximum height of a previously placed piece. The player wins if all available pieces are placed and the structure remains standing. The player loses if the structure collapses while pieces are still available.

Creative mode

Players can freely choose available pieces to build something beautiful. The optional expandable base allows for more flexible placement and creative freedom.

Alternative rules

- If the game is too easy – use more pieces or try smaller base for less starting points and less stability.
- Add more unique pieces from the Pentacells expansion or the Confounders.
- If the game if too hard – use less pieces or try larger base for more starting points and more stability.
- Players take turns building their own separate towers. The winner is the player who builds the tallest structure before pieces run out. Any player whose structure collapses loses.

Gameplay tips

- It may seem impossible to place pieces on top without collapsing the structure. Try placing pieces lower instead—remember, the player who causes the collapse always loses.
- Because the base is narrow, building too far to the side can destabilize the structure. Use this strategically.
- Build your own branch instead of always following other players' builds.

For 3D printing

No supports required.
Nozzle: 0,4 mm
Parameters: 3 or more
Cooling: 100%

If you have trouble with curling corners, avoid "Speed" profiles – print slower, leave the enclosure open, try reducing the nozzle temperature (e.g. 205 °C for PLA and Silk).
"Ensure vertical shell thickness" can be Disabled to save filament

After printing

Make sure all pieces are smooth, with no blobs, bulging corners, elephant's foot or other over-extrusions. Brims should be removed. The pieces should interlock freely, with slight play and no friction or sticking.

For Remixing

To replicate or make custom pieces, you only need three dimensions:

1. The distance between opposite square faces of the truncated octahedron is 19.7 mm.
2. The edges connecting hexagonal faces of the truncated octahedron are filleted with a radius of 1 mm.
3. The distance between the centers of neighboring truncated octahedrons is 20 mm.

Changelog

2026 02 07 - Description tweaks.
2026 02 04 - Pentacells expansion release.
2026 01 28 - Removed individual pieces from files. It is possible to split the set to get individual pieces.

Model files



hedronstack-pieces-set.stl



hedronstack-base-small.stl



hedronstack-base-medium.stl



hedronstack-base-large.stl



hedronstack-base-expandable.stl

License

This work is licensed under a
Creative Commons (4.0 International License)

Attribution—Noncommercial—Share Alike

✖ | Sharing without ATTRIBUTION
✔ | Remix Culture allowed
✖ | Commercial Use
✖ | Free Cultural Works
✖ | Meets Open Definition