A screenshot of a game

AI-generated content may be incorrect.

Here’s a clean layout plan for pairing **16 mm marbles** with a [**60 LEDs/m WS2812B strip**](https://www.amazon.com/dp/B01CDTE9UC?th=1) (≈ 16.67 mm LED pitch) so that each marble gets its own “pixel” without crowding or gaps.

**📐 Core Measurements**

| **Element** | **Size / Spacing** |
| --- | --- |
| Marble diameter | 16 mm |
| LED pitch (center‑to‑center) | 16.67 mm |
| Recommended hole center spacing | 16.7 mm |
| Recommended hole diameter | 15.8–16.0 mm |

**🛠 Grid Layout Tips**

* **1:1 mapping**: Align each marble center directly over its LED center.
* **Frame thickness**: Leave ~0.5–1 mm wall between each hole for strength (material permitting).
* **Alignment tolerance**: ±0.2 mm is fine — LEDs emit wide enough light to fill marble face.
* **Edge spacing**: Keep 8–10 mm margin between first marble center and frame edge for wiring.

**🔲 Example Panel Dimensions**

For a **10 × 10 marble panel**:

* **Active area** = 9 × 16.67 mm horizontal spacing by 9 × 16.67 mm vertical spacing  
  ≈ 150 × 150 mm of marble grid.
* **Outer frame** (with edge margins) ≈ 166 × 166 mm.

**💡 Build Notes**

* **Light cups**: Small reflective wells behind each LED help direct light into marble.
* **Diffusion control**: For sharper pixel edges, mask or paint backs so only LED‑lit face glows.
* **Modularity**: Keep panel in even increments so you can tile multiple modules seamlessly.

# Hardware Notes

* For reference, the kaleidoscope has 20 x 39 = 780 pixels
* A ‘standard’ marble is 14-16mm in diameter
* A [**60 LEDs/m WS2812B strip**](https://www.amazon.com/dp/B01CDTE9UC?th=1) has a 16.67mm LED pitch
  + Dave’s 3D printer has a print volume of 350 x 350 x 325 mm or 20 x 20 = 400 marbles.

## Power

* usb c pd adjustable power supply

# Software Notes

1. marble clock
2. marble roller
3. Display static patterns/images
4. Display dynamic patterns/images
5. Animated transitions
   1. Try alpha blending between marbles in motion (ala Matrix/Kaleidoscope) to give a better sense of motion. Look at “lerp” (ask AI).
   2. Marbles ‘fall’ from the top down in a random pattern ala connect 4 ([need a physics engine](https://github.com/ESPboy-edu/ESPboy_tinyphysicsengine)?)
   3. Marbles ‘fall’ out the bottom ala Connect 4
   4. Marbles ‘roll’ down from row to row filling in the picture
   5. Standard transitions:
      1. Simple Cut
      2. Fade to/from black
      3. Alpha blend to next picture
      4. Wipe
      5. Push/slide from left/right/top/bottom - old slide out, new slide in