

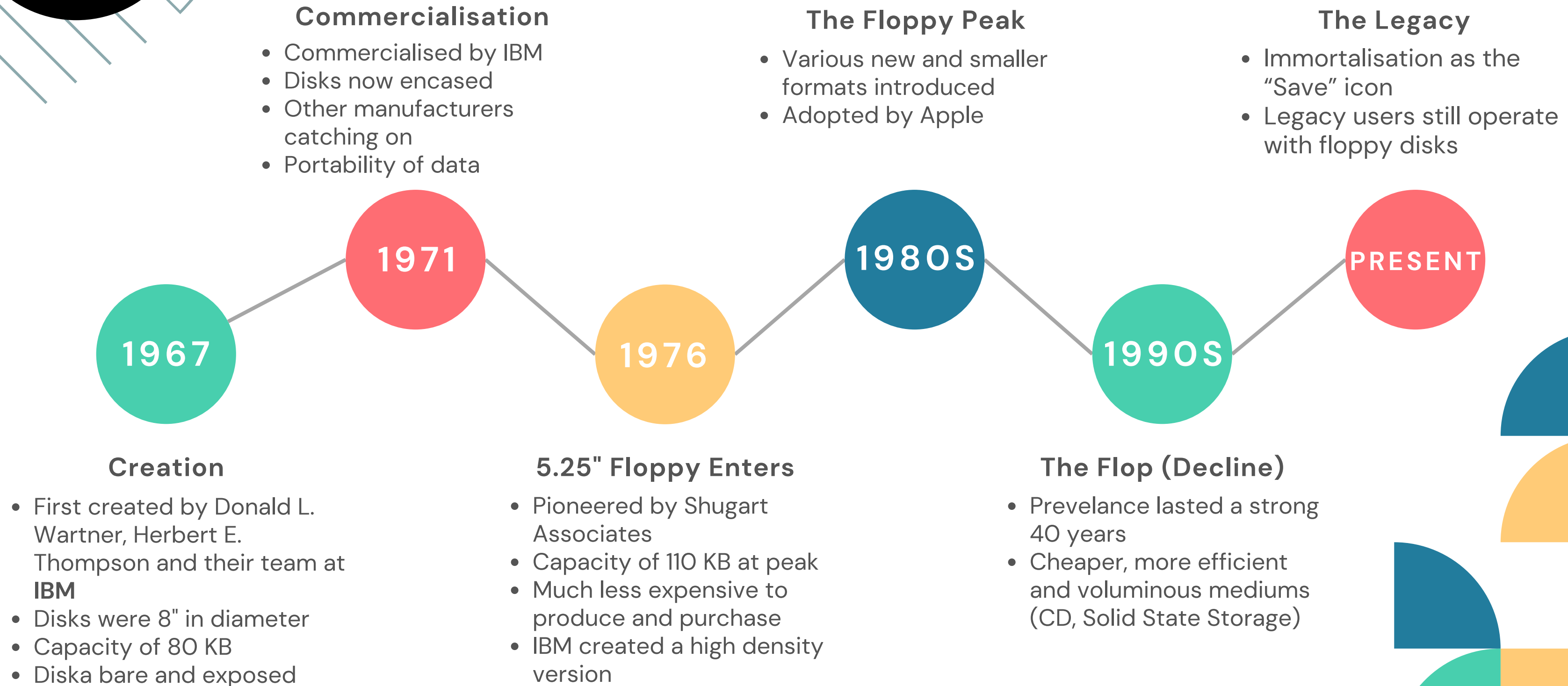
FLOPPY DISKS

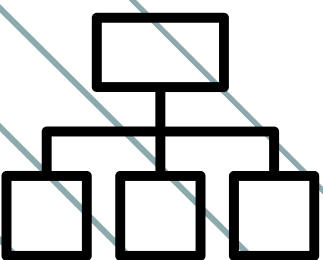
Archit Murali & Jeet Shah





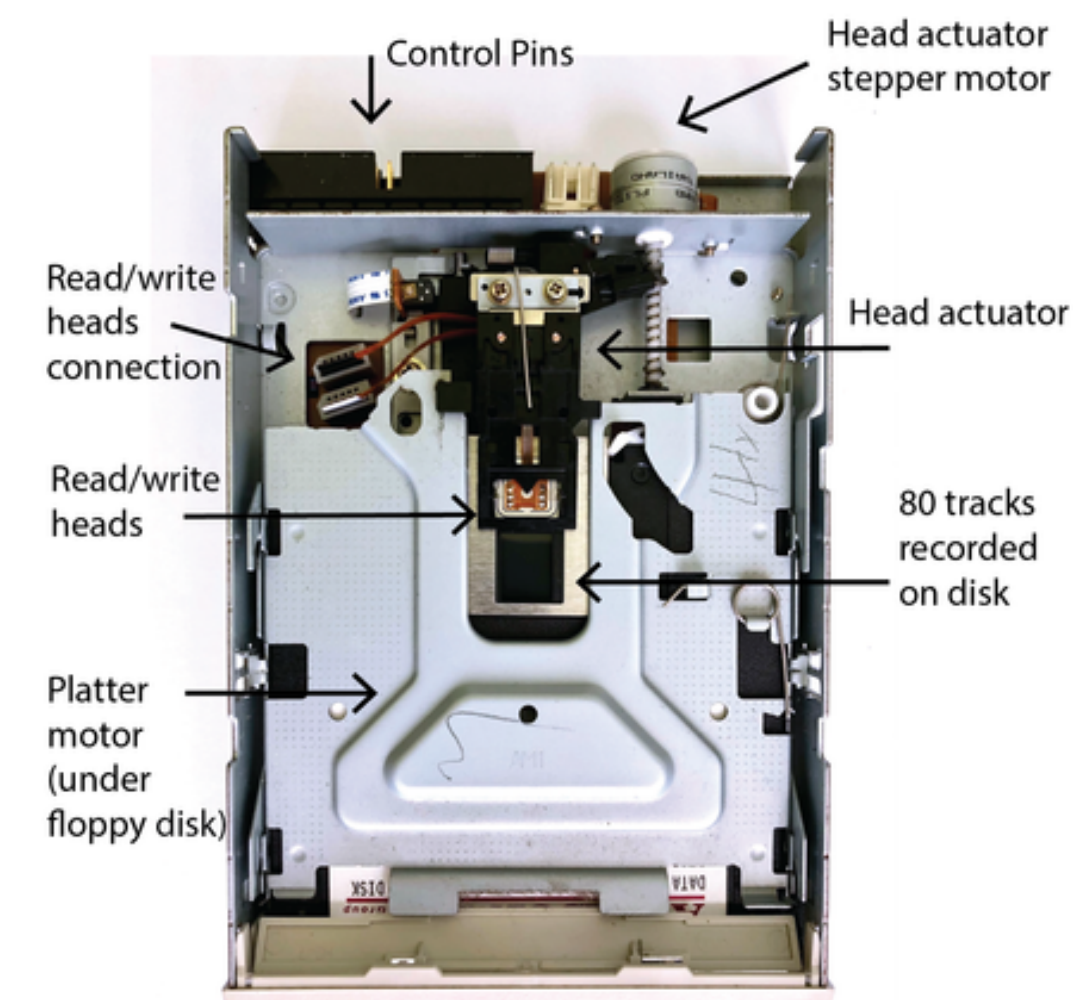
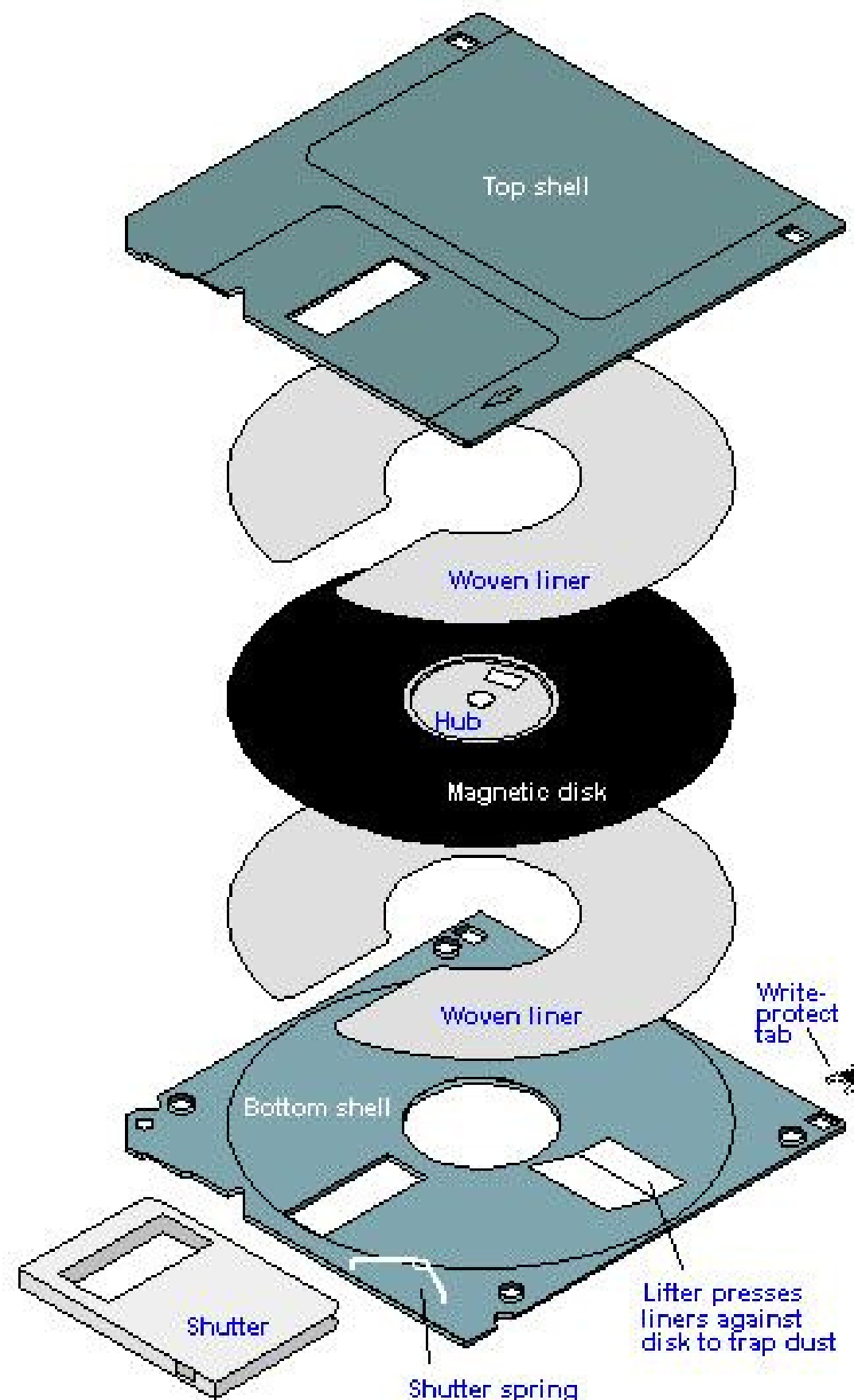
THE FLOPPY HISTORY

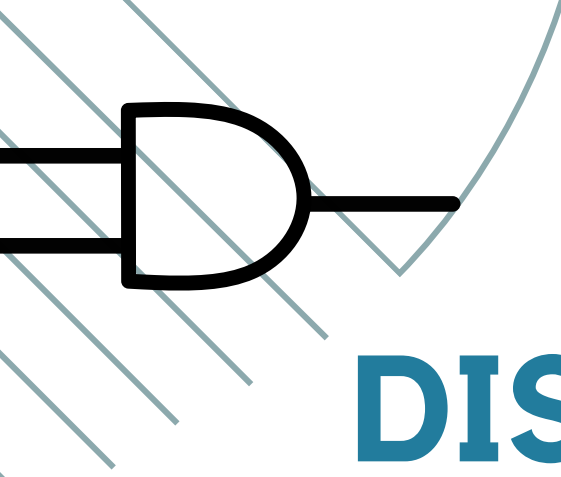




THE FLOPPY STRUCTURE

- The only “Floppy” part is the magnetic disk
- Magnetic coating compounds:
 - DD: 2 μm magnetic iron oxide
 - HD: 1.2 μm cobalt-doped iron oxide
 - ED: 3 μm barium ferrite
- Design:
 - Pro: Intuitive usage
 - Con: Prone to dust





DISK BUT MAKE IT FLOPPY

- **Track:** Circular strip of physical data blocks
- **Sector**
 - An element of a track
 - 512 bytes in size
- **File Structure:** FAT-12

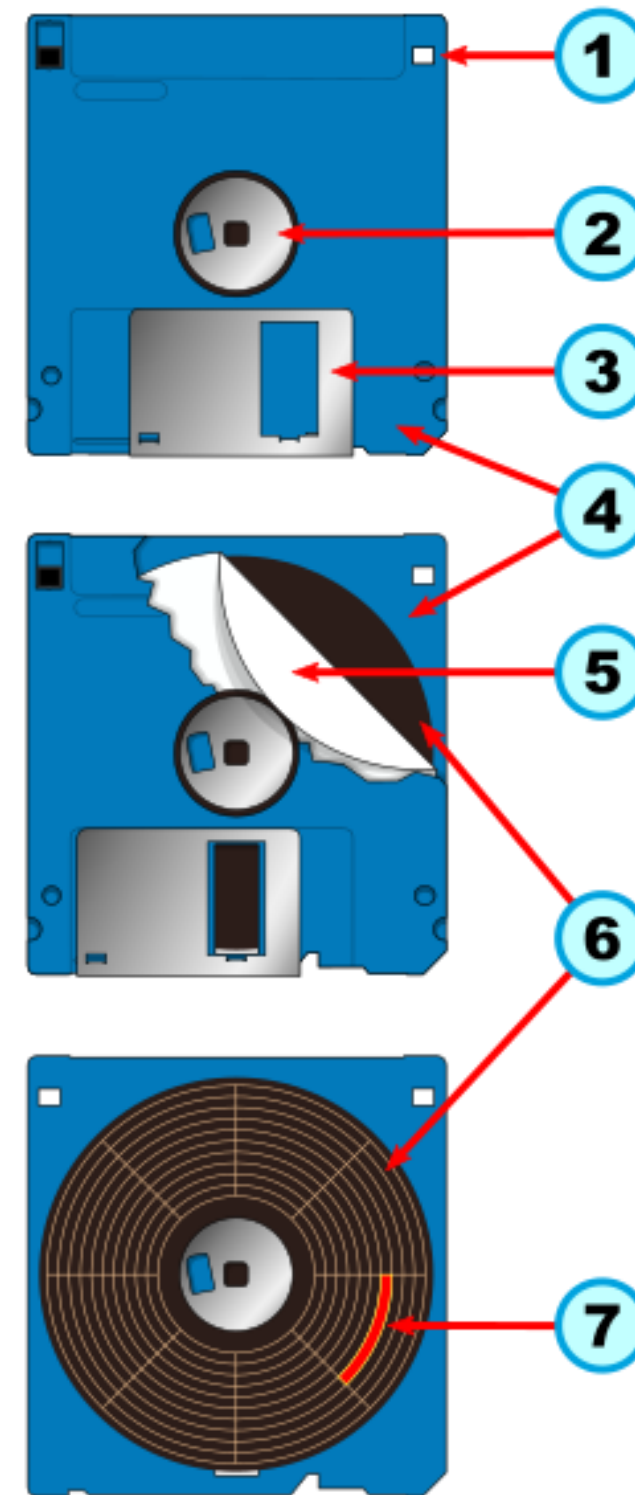
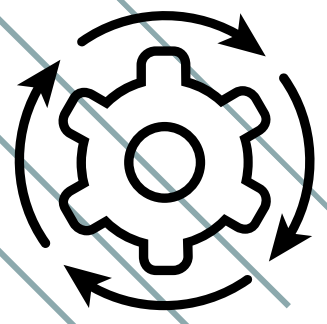


Diagram Labels:

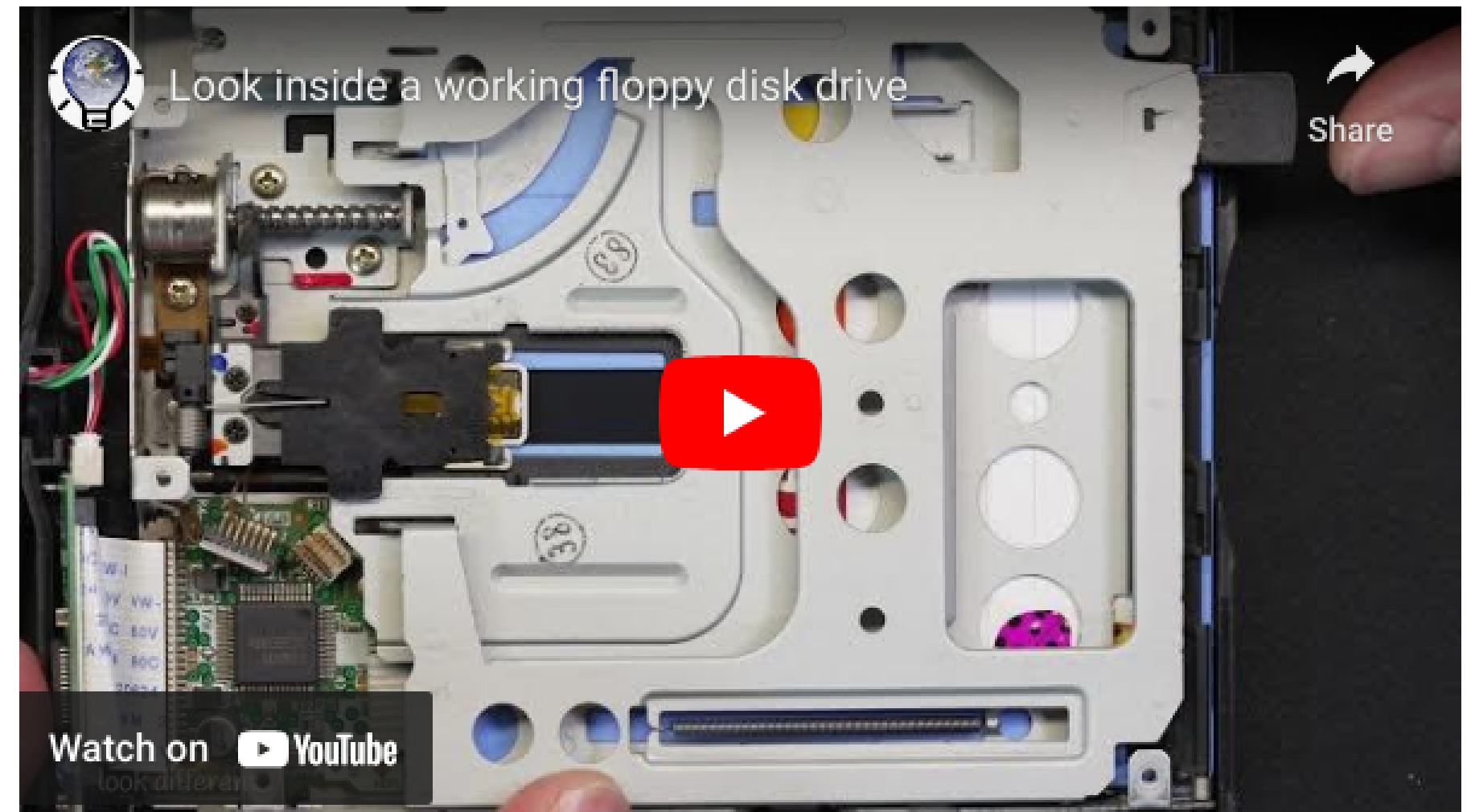
1. A hole that indicates a high-capacity disk.
2. The hub that engages with the drive motor.
3. A shutter that protects the surface when removed from the drive.
4. The plastic housing.
5. A polyester sheet reducing friction against the disk media as it rotates within the housing.
6. The magnetic coated plastic disk.
7. A schematic representation of one sector of data on the disk; the tracks and sectors are not visible on actual disks.





FLOPERATIONS

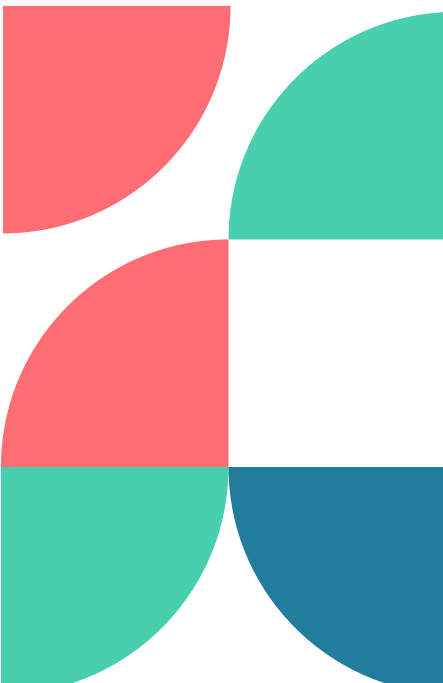
- **Head**
 - Constant Angular Velocity
 - Constant Linear Velocity
 - Not always spinning
- **Sector**
 - Identifier Bits
 - File Data
 - CRC; Error correction
- **Track**
 - Hole punch
 - Phototransistor





PERFORMANCE

- Intel 8271 Floppy Disk Controller:
 - Used in the late 1970s.
 - This was an 8-bit controller.
 - Operated in a machine clocked at 1 MHz.
 - Incurred a ~400ms spin-up cost.
 - Had a >50ms head seek time for reading a 40 track, single-sided, single-density, 5.25", 3 KByte/track disk.
 - The cost of bytes transferred was 4–8ms per byte written.
- Spin-Up Cost and Seek Overhead:
 - Reading/writing a >3 Kbyte file would incur over a second of spin-up and seek overhead.
 - This was before adding the cost of the bytes transferred.
- Sector Operations:
 - Tracks were typically partitioned into 128, 256, or 512-byte sectors (blocks).
 - A sector operation would incur a ~60ms penalty.
 - This was as the device waited for the desired sector to come under the head.



The background features four decorative geometric patterns in the corners. The top-left corner has a series of parallel diagonal lines in a light blue-grey color. The top-right corner contains a cluster of overlapping semi-circles in yellow, red, teal, and dark blue. The bottom-left corner also features a cluster of overlapping semi-circles in red, teal, and dark blue. The bottom-right corner has a series of parallel diagonal lines in a light blue-grey color, mirroring the top-left pattern.

THANK YOU