**Episode 3 A WORLD OF INFORMATION**

*OUTLINE* *Techno Mum and Sam are at World School. Today they are finding out how technology can help create the huge amounts of digital storage needed to create a more fair world.*

**INTRO: TECHNO MUM’S WORLD SCHOOL**

*NARRATOR: Imagine a future where technology could help create a more equal world. Welcome… to World School. Come on in.*

**SFX: SCHOOL BELL - BABBLE OF CHILDREN IN BACKGROUND**

**TANNOY: *“Attention all students – remember to upload your homework to the cloud before the end of the day”***

SAM: I always think of the cloud as being up in the air. Loads and loads of data swirling above our heads!

TECHNO MUM: It’s very much more down to earth than that – more like enormous data centres holding information for the billions who use the internet every second.

SAM: How much data do you think swishes through those centres?

TECHNO MUM: The short answer is – a LOT! It’s estimated that the world’s data storage capacity is currently about 295 exabytes - that's 295 BILLION gigabytes! If you put all of that data onto blu-ray disks, you’d have a stack of discs that would stretch way past the moon.

SAM: But what if that storage runs out?

TECHNO MUM: Well, that COULD happen. And if it did, things would be much harder – because computing power, communicating digitally and storing information online makes life a lot easier and more efficient.

SAM: I guess that if there were storage limits, it would need to be rationed. I wonder who would decide who could search, upload photos or buy things online? Could be unfair if only rich people or countries had access.

TECHNO MUM: Exactly. Data really does make the world go around, so you can see how important it is that we have enough storage for everyone – and in a way that’s sustainable for the future. Fortunately, technology companies are working on some pretty exciting new ways to store data. Come on, let’s go virtual and find out more!

**SFX: WHOOSH / FURNACE**

TECHNO MUM: One hot new technology is called Heat-Assisted Magnetic Recording. It uses lasers to spot-heat small sections of a computer’s internal disk. Heating these sections changes the amount of magneticity which enables more data to be stored in a smaller area. Remember those blu-ray discs extending past the moon? Well, if you recorded all of the books ever written, you’d only need 20 HAMR devices to store all the data!

**SFX: WHOOSH! / WIND /AIR RUSHING – TECHNO MUM RAISES VOICE**

TECHNO MUM: Next up, Helium - a gas that’s lighter than air! Sealing computer drives in helium means there’s less friction – and that means less electrical power is needed and more data can be stored.

**SFX: WHOOSH / CLINKING CHAINS**

TECHNO MUM: Now, I know this might sound unbelievable, but biological material in the chains of DNA could be used for storage. One gram of DNA has the ability to store up to [215 petabytes](https://science.sciencemag.org/content/355/6328/950) of data, although it’s a painstaking process that requires scientists for every step.

SAM: So… PEOPLE could be walking data stores?

TECHNO MUM: Maybe but that’d be a long way in the future. At the moment, only tiny fragments of DNA have been used to store data, but who knows!

**SFX: WHOOSH - SHATTERING GLASS**

TECHNO MUM: And how about 5D glass! Lasers can create tiny physical 5D structures inside glass called nanogratings. Computers read these by looking at their orientation – their location on the x, y, and z axes, and the strength of their light refraction. Glass disks can store up to [360 terabytes](https://www.theverge.com/2016/2/16/11018018/5d-data-storage-glass) of data. They won’t degrade for billions of years and can withstand very high temperatures. And if THAT sounds futuristic – welcome to Quantum computing!

SAM: That’s SERIOUSLY cool!

**SFX: SCHOOL BELL**

TECHNO MUM: Think about how you use data on the internet and how life would be different without it – you’d have to carry books to school, visit a library to find things out and stick to board games!

**OUTRO: TECHNO MUM’S TECHNO MUM’S SUSTAINABLE TECHNOLOGY. CREATED WITH SUPPORT FROM THE INSTITUTION OF ENGINEERING AND TECHNOLOGY. FIND OUT MORE AT FUN KIDS LIVE. COM / TECHNO MUM**