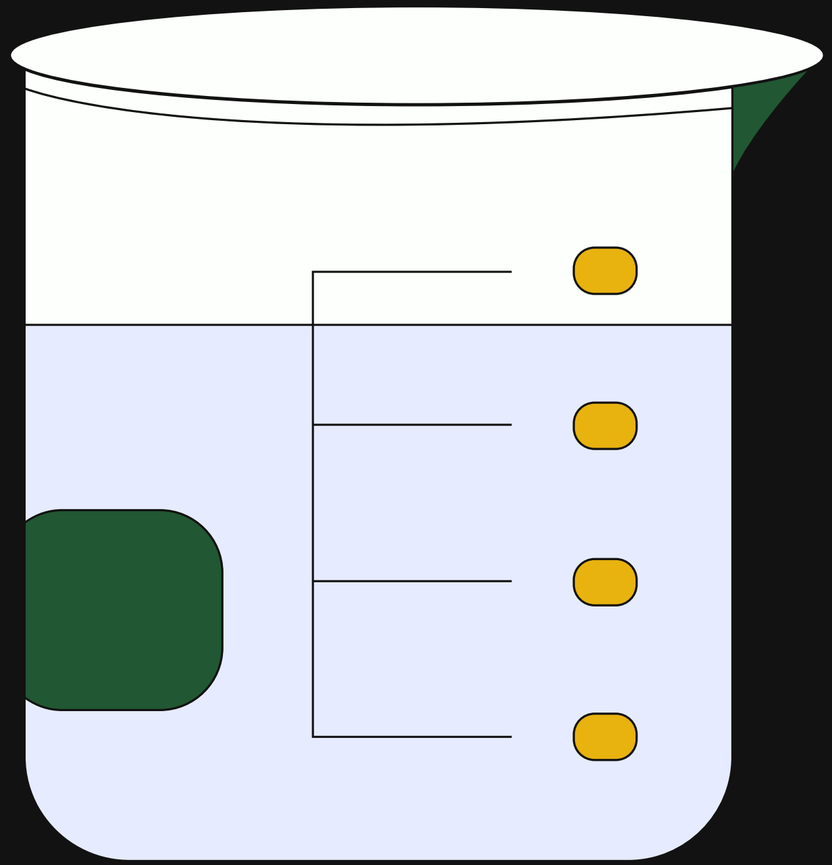
MICROGRAVITY AND ITS EFFECTS ON THE VISUAL SYSTEM

PLTW AEROSPACE ENGINEERING

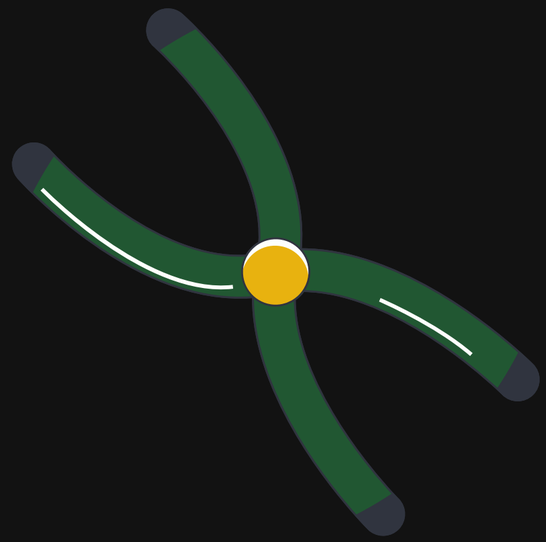
March 12, 2025

Ansh and Liam

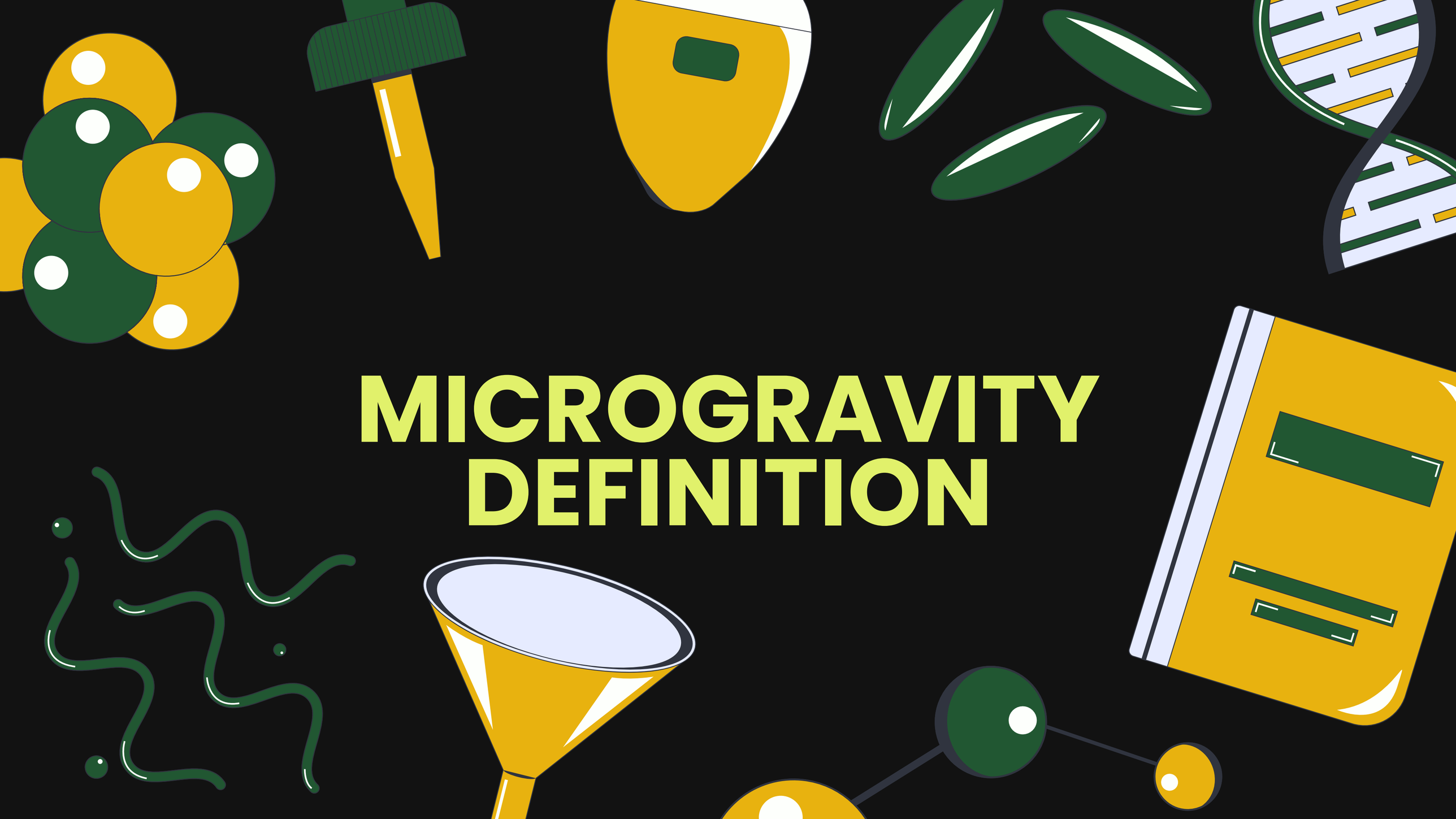


AGENDA

1. WHAT IS MICROGRAVITY
2. GRAVITY EFFECT ON VISUAL SYSTEM
3. HOW IS VISION AFFECTED IN MICROGRAVITY
4. HOW WE PREPARE OUR VISION FOR SPACE
5. RESEARCH ON VISION IN SPACE
6. HOW ATMOSPHERE AFFECTS VISION
7. HOW LONG DOES IT TAKE TO GO BACK TO NORMAL

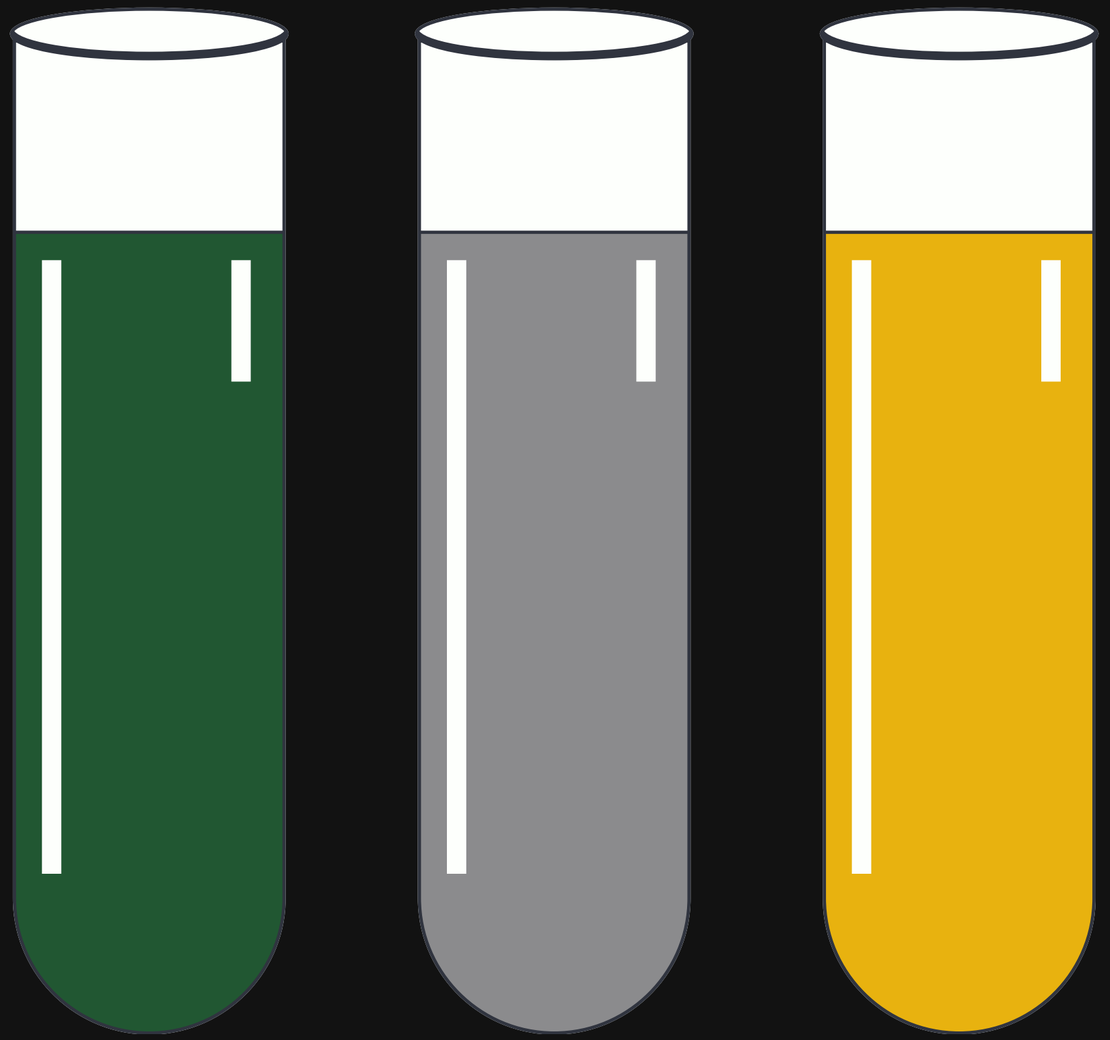


MICROGRAVITY DEFINITION



WHAT IS MICROGRAVITY

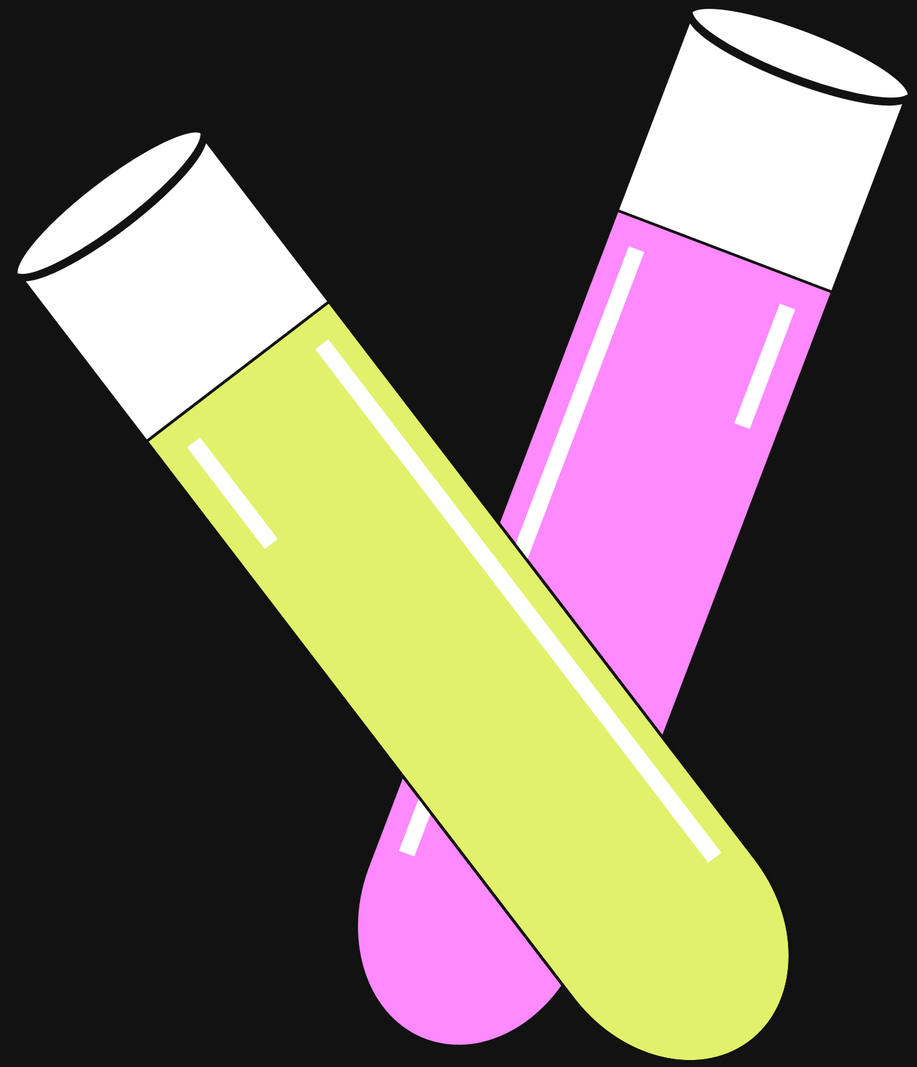
VERY WEAK GRAVITY, AS IN AN ORBITING SPACECRAFT.

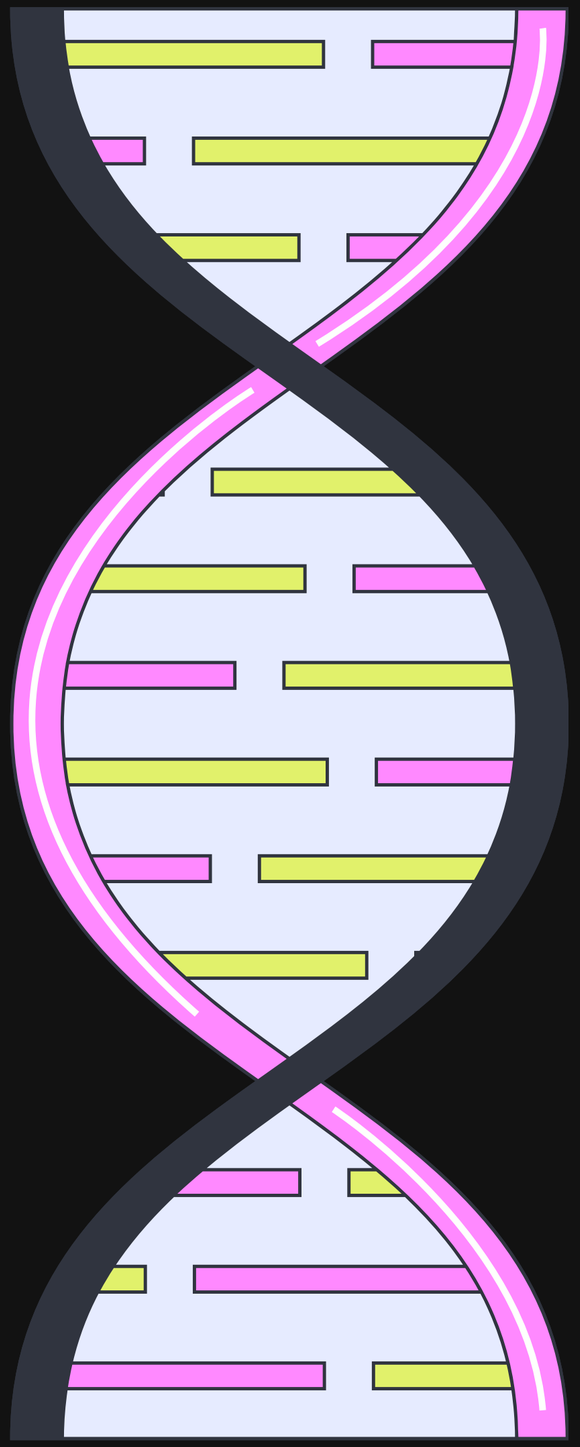


QUESTIONS

HOW DOES GRAVITY AFFECT THE VISUAL SYSTEM ON EARTH?

Gravity keeps intraocular pressure (IOP) by compressing fluid in the eyes.
It circulates aqueous humor, making sure there is no glucoma.
It influences the circulation of blood.
Depth perception is based on gravity.
Gravity keeps tears flowing instead of forming blobs.



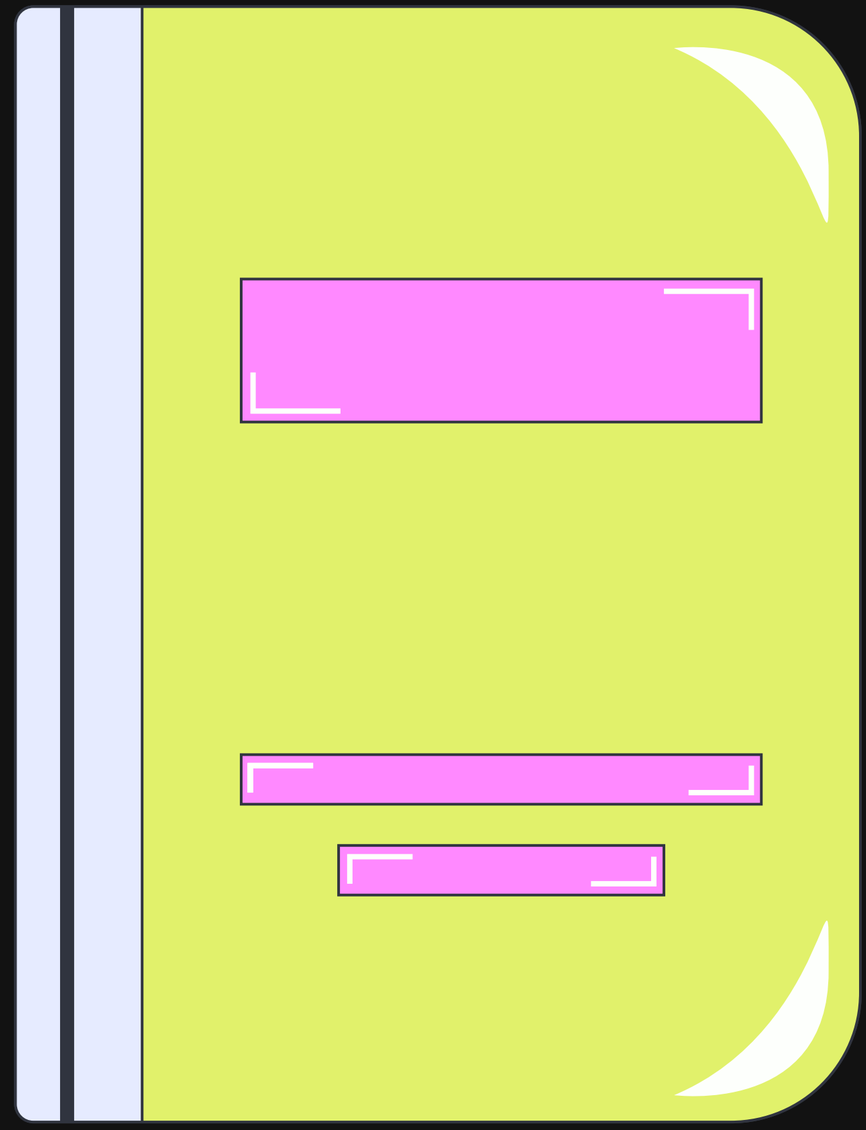


HOW IS THE HUMAN BODY AFFECTED BY MICROGRAVITY?

In microgravity, fluids shift upward, increasing pressure in the skull. This can flatten the eyeball, causing farsightedness, and may lead to optic nerve swelling and vision changes.

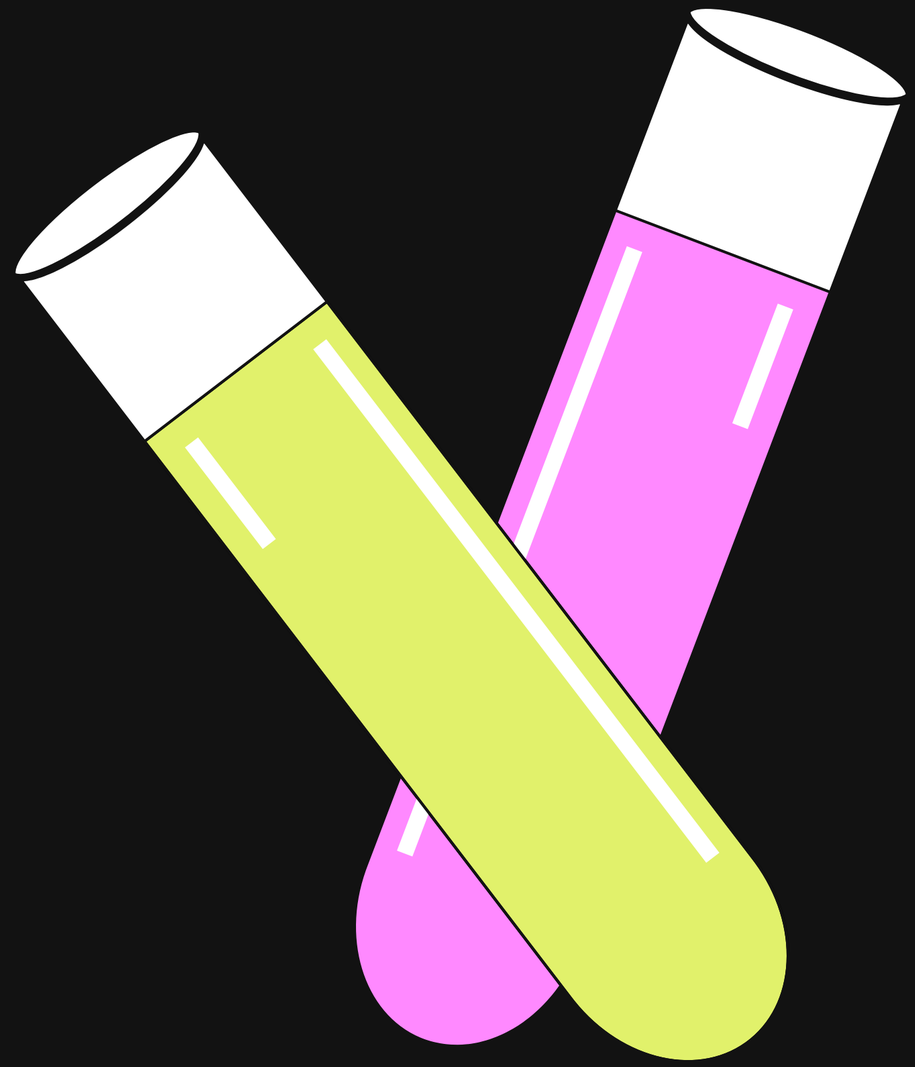
HOW CAN HUMANS PREPARE THIS BODY SYSTEM FOR SPACE TRAVEL?

Astronauts prepare their vision for space travel through comprehensive eye exams, custom corrective lenses, and vision training exercises. Strategies like fluid management techniques and antioxidant-rich diets also help reduce vision issues caused by microgravity.



WHAT RESEARCH IS BEING CONDUCTED TO PREPARE FOR FUTURE SPACE TRAVEL?

Research on vision in space focuses on understanding fluid shifts that increase pressure in the skull, which can affect eyesight. Scientists are developing countermeasures like specialized exercise routines, lower-body pressure devices, and improved nutrition to prevent long-term vision problems in astronauts.

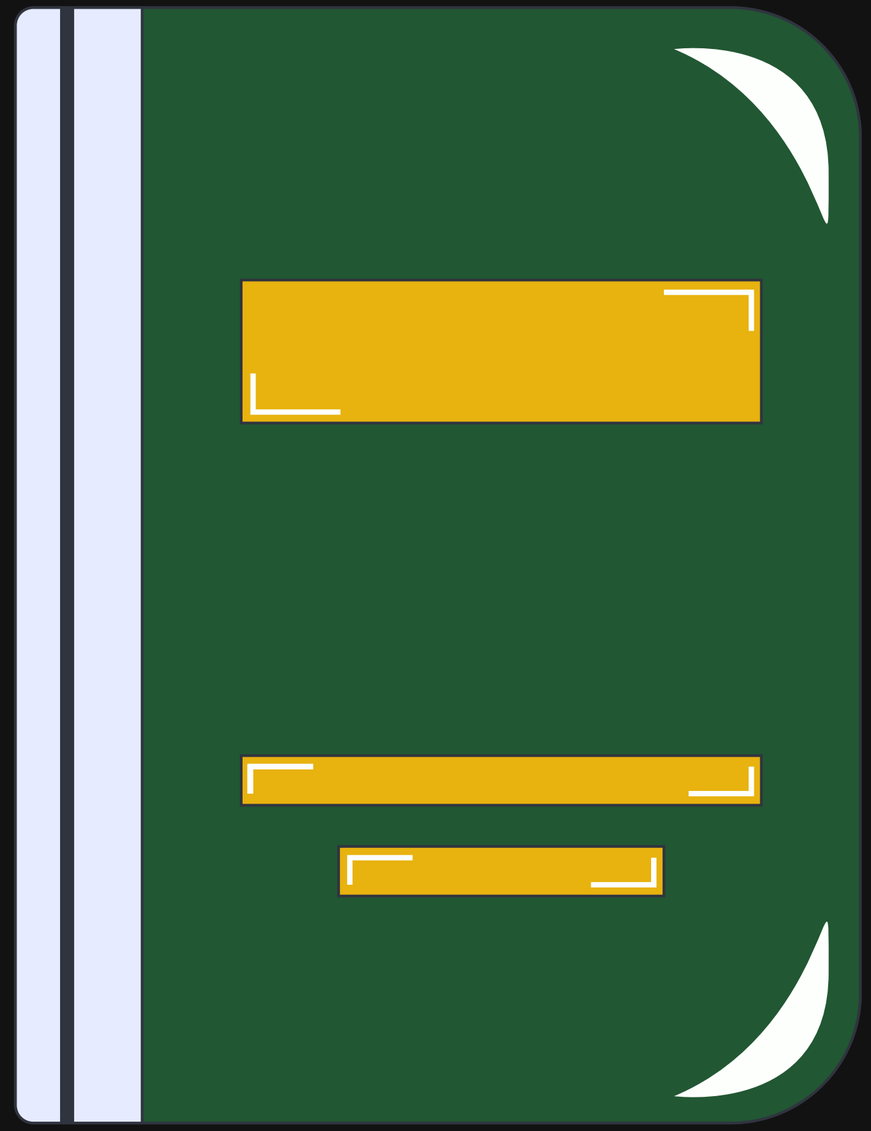


WHAT ATMOSPHERIC AND GRAVITATIONAL CHANGES DIRECTLY AFFECT THIS SYSTEM?

Microgravity causes bodily fluids to shift upward, increasing pressure in the skull and around the eyes, which can distort vision. Atmospheric changes, such as altered oxygen levels and cabin pressure in spacecraft, may also impact eye health and overall visual function.

HOW LONG DOES THE SYSTEM TAKE TO FUNCTION NORMALLY AGAIN WHEN BACK ON EARTH?

The visual system typically takes weeks to months to return to normal after astronauts return to Earth. However, some may experience lasting vision changes due to prolonged pressure effects on the eyes and optic nerve.



THANK YOU FOR LISTENING!

DON'T HESITATE TO ASK ANY QUESTIONS!