Hologram Zoo Teaching Guide – Years 11–12 (VCE STEM Focus)

Program Title: Perception & Projection – Advanced Optics and Visual Technologies

Program Summary

This VCE-level program offers senior students a practical and analytical exploration of light systems, projection technologies, and immersive design. Drawing connections to Units 1–4 of Physics, Systems Engineering, and Design & Technologies, students investigate energy transfer, laser optics, polarisation, and the engineering principles underpinning visual experiences.

Connect – Pre-Visit Activities

- Review wave-particle duality and light transmission in different media.
- Introduce polarisation, interference, and the functioning of optical components.
- Explore applications of lasers and lenses in fields such as medical imaging, communications, and entertainment.

Understand – On-Site Experience

- Students rotate through:
  • Optical Systems Analysis – A technical breakdown of Hologram Zoo's projection systems, including laser arrays, lensing, and alignment.
  • Visual Cognition and Design – Exploration of how the brain interprets layered visuals, timing, and field-of-view.
  • Production Engineering – Green screen experimentation with spatial layering, depth cues, and media design workflows.
- Concepts are linked to real-world physics, systems, and design technologies.

Act – Post-Visit Classroom Activities

- Model energy loss and wave interference in a holographic system.
- Write a technical report evaluating one part of the Hologram Zoo system with reference to VCE standards.
- Design a prototype visual system for science communication or immersive education.
- Analyse the perceptual limits of polarised light and screen-based illusions.

Curriculum Links (Victorian Curriculum – VCE Units 1–4)

- Physics Unit 2: AOS1 – How can motion be described and explained?
- Physics Unit 4: AOS2 – How can waves explain the behaviour of light?
- Systems Engineering Unit 3: AOS2 – Integrated controlled systems and energy transfers
- Systems Engineering Unit 4: AOS1 – Design, planning, construction and iteration
- VCE Applied Computing: AOS1 – Data and visualisation design
- VCE Media: AOS1 – Representation and technologies of representation

STEM or Inquiry Extensions

- Develop a comparative study of optical illusions across technologies (VR, AR, holograms).
- Use computational tools to simulate lens and laser interactions.
- Create a research poster or media package explaining the limits of human perception and how visual systems exploit them.

Teacher Reflection

Use this section to evaluate how effectively students applied VCE-level concepts to complex, real-world visual technologies and systems thinking.