# Test Plan｜Interactive Prototype 1

**Project Name: Star River Notes – Immersive Knowledge Map Space  
Test Duration: About 5 minutes per participant (including instructions)**

**1) 3-sentence Pitch**

* This is an XR/3D prototype that turns notes into a “3D universe,” allowing users to create, connect, and browse knowledge nodes in space.
* Users can create nodes and connect topics with simple gestures/mouse operations.
* The goal is to verify: whether spatial organization is more helpful than 2D in understanding relationships, memorizing structures, and quick navigation.

**2) Test Objectives and Hypotheses**

O1 Usability/Learnability: Whether participants can complete the core operation of “linking nodes” within 30 seconds on first attempt.  
O2 Navigation and Understanding: In a given small topic map, whether participants can quickly find the target node and explain its relationship with two neighboring nodes.  
O3 Sense of Structure/Load: Whether spatial layout reduces subjective load and enhances the sense of structural understanding.

**3) Methodology**

Method: Task-based usability testing + light comparison (with 2D schematic JPG for sequence search) + quantitative data and short interviews  
Design: Within-subject design, balanced order (AB/BA rotation: 3D first then 2D, or 2D first then 3D)  
Data Types:

* Objective: completion time (seconds), number of errors (mislink/misselection/undo), path steps, whether asked for help, completion rate
* Subjective: SUS-Lite single item (2 questions), sense of understanding (1–7), enjoyment (1–7), NASA-TLX (simplified 3 dimensions: mental demand, effort, frustration)
* Qualitative: think-aloud / post semi-structured interview key points and verbatim fragments

**4) Prototype Description (Functions Under Test)**

* Linking: establish an edge between two nodes
* Navigation (right-drag/keyboard WASD/arrow keys): pan and zoom in the graph

**5) Participants and Sample Size**

* Target group: classmates and tutors with backgrounds in interaction design/computing
* Sample size: ≥5 people (6–10 people in class would be better)

**6) Materials and Environment (Setup)**

* Equipment: Windows laptop (with Unity build/Editor), mouse/touchpad, timer (phone)
* Environment: quiet desk, observer sitting diagonally behind to record

**7) Test Procedure (5 minutes/person)**

Welcome and Instructions

* Obtain verbal consent; do not collect personal sensitive information

Familiarization (not scored)

* 10–20 seconds demo: how to create nodes, link, enter focus mode, zoom and pan
* Participant tries once creating and once linking

Task Execution (timed)

* Task 1 (O1): Name a node “Topic-A” and connect it with “Topic-B”
  + Record: completion time, number of errors, whether asked for help
* Task 2 (O2): In the given small map, find the “Goal-X” node, and describe its relationship with two neighboring nodes
  + Record: locating time, path steps, whether the relationship description is reasonable

Questionnaire (Subjective)

* SUS-Lite (2 questions: usability, confidence)
* Sense of understanding (1–7), enjoyment (1–7)

Post-interview (Qualitative)

* Key questions (choose 2–3):
  + Which action was the most intuitive/difficult? Why?
  + Compared to 2D, what was the most “useful” moment you experienced in 3D?

**8) Success Criteria**

* SC1 (O1): ≥80% of participants complete “write + link” within 30 seconds, errors ≤1
* SC2 (O2): Average locating time ≤25 seconds; ≥80% can correctly describe 1 relationship
* SC3 (O3): Sense of understanding ≥5/7; NASA-TLX total score lower than 2D (median score drops at least 1 point)