# **Paint360**

**Testing Plan for Interactive Prototype 2**

### **Project Description**

Paint360 is an immersive drawing and painting prototype built in Unity for Meta Quest using hand-tracking. Users draw with pinch gestures, mix colours with their non-dominant hand, paint objects via raycasting, erase with palm gestures, and preview their palette through spatial UI feedback. The goal is to evaluate whether hand-based gestures and visual feedback (pointer rays, highlight glow, palette sphere/ring) allow users to intuitively create, modify, and erase drawings in VR.

## **Testing Objective**

From my updated concept, I want to evaluate:

* Can users intuitively understand and use the **hand gesture mappings** (draw, palette githubmixing, paint object raycast, erase with palm)?
* Do the **palette feedback elements** (colour ring above left palm) help users understand colour selection and mixing?
* Is the **raycast pointer** clear and easy to control when painting objects?
* Does erasing with palm feel natural (like a wipe) without orientation constraints?

This test will reveal which gestures feel intuitive and where more feedback or redesign might be needed.

## **Methodology**

* **Observational usability testing** with think-aloud protocol.
* Participants complete drawing and painting tasks using hand gestures while I observe.
* Collect task completion time, hesitation, errors, and verbal feedback.
* Short debrief interview afterwards.

## **Prototype Description / Requirements**

The VR prototype supports:

* **Draw Tool:** Right index pinch draws lines in 3D space.
* **Colour Palette:** Left-hand thumb, index, and middle pinches mix red, green, and blue; preview sphere/ring shows current mix.
* **Object Painting:** Right thumb+middle pinch raycasts forward with visible pointer; target objects glow yellow before being painted.
* **Eraser:** Left thumb+pinky enables erase mode; right palm wipes away strokes in its radius.
* **Visual Feedback:** Cyan pointer line, highlight glow, palette preview.

## **Data Collection**

During testing I will:

* Observe gesture accuracy, hesitation, and confusion.
* Record task completion times.
* Log comments from participants.
* Capture video/screen recording (with consent).
* Note whether visual feedback (pointer, highlight, preview sphere/ring) supports understanding.

## **Testing Setup**

* Meta Quest headset with Unity build installed.
* Clear VR play area.
* Notebook or spreadsheet for logging observations.
* Testing script with tasks prepared.
* Phone or OBS capture for recording (if consent).

## **Testing Process (Approx. 6–7 min total)**

**Introduction (30 sec)** Explain prototype, gestures, and overall goal: explore hand-based drawing and painting.

**Orientation (1 min)** Demonstrate gestures briefly:

* Right index pinch = draw.
* Left hand = colour palette (sphere/ring).
* Right thumb+middle = paint object with pointer ray.
* Left thumb+pinky + right palm = erase.

### **Tasks**

**Task 1: Draw Tool (40 sec)**

* Ask participants to draw a simple shape (e.g. red heart).
* Ask them to mix a colour (e.g. purple) with the left-hand palette and draw another shape.
* Observe colour mixing and drawing intuitiveness.

**Task 2: Object Painting (30 sec)**

* Ask participants to point at a cube
* Paint it using a raycast gesture.
* Observe use of pointer lines and highlight glow.

**Task 3: Colour Mixing & Preview (30 sec)**

* Ask participants to mix colours to get olive and confirm preview circle matches.
* Ask them to draw a multicoloured object by changing palette mid-stroke.

**Task 4: Eraser (30 sec)**

* Ask participants to activate eraser mode (left thumb+pinky).
* Use your right palm to wipe away their drawing.
* Observe how natural the wipe feels.

**Task 5: Free Expression (1 min)**

* Let participants freely draw, mix colours, paint objects, and erase.
* Observe natural workflow and tool switching.

## **Time on Task (sample logging)**

* Task 1 (Draw Tool): 48 32
* Task 2 (Object Paint): 20 19
* Task 3 (Colour Mixing): 20 17
* Task 4 (Eraser): 30 36

## **Debrief Questions**

**General Impressions**

* How did it feel to create art with only hand gestures? Was the experience enjoyable?

Difficult, different stationary and tools

Creating art was fun, gestures were cumbersome they didn’t feel natural. Gestures don’t need to be hold active. Drawing with holding gestures was hard.

**Specific Tools**

* Which gesture felt most natural? Which gesture was confusing or hard to perform?

Changing colour was confusing because they didn’t show which colours to mix.

Thumb to pinky, palm to erase was simple, drawing of the erasing the action.

* Did the pointer ray help when painting objects?

Raycast not annoying

Good, but doesn’t need to be there all the time

* Did you find any of the tools clunky to use or poorly designed?

Drawing was hard because it wasn’t from the gesture hand the line came from a different finger

Erase interaction was rough, paint was good and precise but coming from the wrong paint

**Workflow & Efficiency**

* Did switching between drawing, painting, and erasing feel smooth?

It’s okay not the best not intuitive you have to learn and look to make sure

Using the thumb to finger didn’t feel intuitive for all tools. Maybe something attached to the arm. Maybe one hand on the controller. The drawing can be not just creation but also manipulation of objects.

* Were there moments of hesitation or frustration?

Drawing by itself because of weird tracking

No frustration, 3d drawing was rewarding

**Suggestions**

* Did you have any suggestions for future development or ideas?

Maybe less hand gestures and a brush or pen you can pick up in VR