Pitch Together Design Document

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2 Days Extension Used for this assignment

Unity Project File: Pitch Together.zip

Demo Video: https://www.youtube.com/watch?v=dZAPvBlLmd4

Collaboration and Roles

Most of the job are evenly split between two users.

- User 1 (Cyan): assembles pole A, supports the west lift handle, installs the two west stakes, and inspects the west side.
- User 2 (Amber): assembles pole B, supports the east lift handle, installs the two east stakes, and inspects the east side.

Either player can place the tent body. Avatar colors, role labels, and matching part markings identify responsibilities.

The main coordination step is raising the frame. Both players must hold their assigned handles at the same time for four seconds. One person cannot advance this step alone. Releasing a handle early lowers the partially raised frame, allowing the pair to try again. Players can agree on a countdown before lifting and warn each other before letting go. Both players must also complete their own final inspection.

This division creates positive interdependence: each learner has an essential contribution. Learning with a partner provides opportunities to observe an action, explain the next step, and discuss mistakes. The shared lift makes communication part of performing the procedure.

Networking

I used Unity Netcode for GameObjects 2.7.0 with Unity Transport 2.6.0. This integrates with the Unity and XR Interaction Toolkit project and supports a local host and client session without an external account or cloud service. One device hosts while participating as a player; the other joins over the same local network through the nearby-camp list or a manually entered host IP address. The session supports two players.

The network synchronizes:

- Presence: player roles and head and hand positions and rotations.
- Objects: positions, rotations, and the player currently holding each item.
- Progress and events: pole installation, raising, stakes, inspections, and shared step cues.

Headset and controller input, locomotion control, interface focus, and ambient forest audio remain local. The resulting tracked poses are shared so the partner can see movement.

Object Control

- The host checks interactions and task order.
- Only one player can hold an object at a time. The first valid grab request wins.

Session continuity

- Late joiners receive the current progress and object states.
- If a client leaves, held items reset and completed progress remains.
- If the host leaves, the session ends.

Awareness and Communication

The partner avatar follows the user's tracked head and hands, making looking, reaching, and gesturing visible. Role colors and labels distinguish the two learners. A shared progress board shows the current stage, while numbered parts, matching targets, placement highlights, and sound cues help explain what to do next. A Signal partner control provides a shared attention cue.

Players communicate through visible gestures and spoken discussion using in-person speech or an external voice call. Integrated voice chat is not included. The lift encourages explicit readiness checks, and the final inspection invites each learner to describe what they checked before confirming completion.

Learning

The lesson scaffolds the procedure through short stages: place the tent body, assemble and install both poles, raise the frame together, secure the stakes, and inspect both sides. Immediate placement feedback lets learners recognize valid actions and recover from mistakes. Observing a partner and discussing the sequence supports social learning, while separate responsibilities encourage active participation.

The forest clearing places the activity in a recognizable camping setting, supporting situated learning through context and spatial relationships. Snap targets and automatic sleeve installation reduce manipulation demands so learners can focus on sequence and coordination. Fabric handling, clipping, threading, and hammering are simplified, and inspection is a learner sign-off rather than an automatic measurement of tent safety. The experience is intended as an introduction to the procedure, with physical practice needed for real equipment.