Proprioception Lab

Instructor guide · four required activities

Set out chairs, light dumbbells with a same-weight pair, a screen for blocking vision, and assorted clean, blunt objects. Project the interactive and have Reference 2 ready.

Prepare in class · about 10–15 minutes

Students review the location and signal for muscle spindles, Golgi tendon organs, joint receptors, and skin mechanoreceptors. They distinguish position from movement sense, predict the vision comparison, and identify afferent and efferent directions. Brief notes are enough. Check that signals travel **in toward the CNS** and motor signals travel **out to muscle**.

Demonstrate · about 10–12 minutes

Show one comparison or sequence at each station. Point to the field students complete **before the reveal**, then model recording it. Partners switch roles and record their own evidence.

Activity · per student	Demonstrate and record	Ask and connect
1 · Position matching **2 positions, each with and without vision**	Hold one arm at a comfortable elbow angle. Actively match with the other arm. Reset the matching arm and try with both arms out of view. Record **close, more bent, or less bent** before feedback. At position 2, start without vision.	“What information remained without vision?” Connect to **position sense** and spindle information about muscle length. Skin and joint information may also contribute.
2 · Dumbbell comparison **2 comparisons; one same-weight**	Seated, use similar elbow angles. Place the reference dumbbell in one hand, then the comparison in the other. Watch grip during handoffs; hide markings during the judgment. Record **lighter, same, or heavier**, then reveal both loads. Switch the reference hand on comparison 2.	“What stayed similar? What changed?” Connect to **muscle–tendon tension** and GTO information. Touch and perceived effort can also inform the judgment.
3 · Tactile identification **1 object per student**	Block vision. With permission, apply a clean, blunt object to **two chosen body locations**. Record details at each and a guess before hand exploration. Still without looking, explore by hand, record new details and a final guess, then reveal. Avoid speech clues and object sounds. Switch roles with a different object.	“What extra details did your hands provide?” Connect to **skin mechanoreceptors** and interpretation of tactile information. Explain this as the broader sensory-input part of the lab.
4 · Movement direction **2 trials; one each direction**	With permission, support the relaxed forearm and slowly move it a small, comfortable amount. The performer looks away and reports **bending or straightening** before the reveal. Record actual and reported directions. Use an unpredictable order.	“Are you sensing where the arm is or which way it moves?” Connect to **movement sense** and spindle signals about length change.

During the lab and debrief

Allow about 35–40 minutes for partner work and transitions. Each student adds **four captioned setup or equipment photos**, one per activity; take the tactile photo after the reveal. Arrange an adapted setup or observer role as needed and document it in notes. Ask, “What did you sense, and how could it guide movement?” Students may finish reflection after class.

Connect the evidence to an application

Ask students to connect one lab observation to a specific sport, coaching, or PT situation. Have them explain what the person needs to sense and which receptor information could help guide the movement. Several signals contribute to a task; the stations cannot establish a single receptor’s contribution.

Open the live lab · Reference 2 in the Motor Behavior module · Updated November 12, 2026