

Swing Lab / build brief

The first useful version

A browser investigation with a pendulum, three sliders, visible units, the calculated period, Pause/Resume and Reset. Length 0.25–4.00 m. Gravity 1.62–20.00 m/s². Bob mass 0.10–2.00 kg. Amplitude fixed at 8 degrees.

Runtime

Use deterministic code for $T=2\pi\sqrt{L/g}$ and the animation. No runtime AI call, API key, login or database is needed. AI Studio is the authoring tool; the finished teaching activity can be a normal browser app.

Teaching interaction

Ask for a prediction before an edit. Let a learner record the changed variable, units and the result. Add a short explanation of the model and its limits. Include a text equivalent and a reduced-motion option.

Acceptance checks

$L=1.00$ m, $g=9.81$ gives $T\approx 2.006$ s. $L=4.00$ m with the same g gives $T\approx 4.012$ s. $L=1.00$ m, $g=1.62$ gives $T\approx 4.937$ s. Changing bob mass leaves the period fixed.

A real improvement

Add comparison mode or an observation download. Retest the three values and all affected controls. Keep the scientific model independent of the decorative animation.

Classroom handoff

AI Studio's developer-account access is a separate question from using the exported deterministic app. Check the final app and local board requirements before a classroom rollout. For the workshop, use preview or the local example.