

X-Ray Circuit Builder v2.8

Short Instructor Guide

Purpose

The X-Ray Circuit Builder is an interactive learning tool for helping radiography students recognize circuit components, practice correct wiring, visualize x-ray production, build speed, and demonstrate independent mastery.

Activity Modes

Practice Circuits — Students build simple closed circuits using a battery and a resistor and/or lamp. Best for introducing current flow and the idea that current requires a continuous path.

Full X-Ray Circuit — Students independently assemble and wire the complete x-ray circuit. Check Circuit provides corrective feedback, making this the primary teaching and guided-practice mode.

Beat the Timer — Students build the complete x-ray circuit against the clock. Levels progress from Learning (5:00) through Builder, Tech, Expert, Shock Mode, and Legend (0:30). Use after students understand the circuit and need retrieval practice and fluency.

Assessment — Students build the complete circuit independently with no correctness feedback before submission. Entering Assessment from another activity automatically clears all components and wires so each attempt begins with a blank workspace.

Recommended Classroom Workflow

1. Introduce the circuit components and their functions before requiring a complete build.
2. Use Practice Circuits first if students need reinforcement of basic current flow and closed-circuit concepts.
3. Move to Full X-Ray Circuit for guided practice. Encourage students to use Check Circuit as feedback rather than immediately giving them the answer.
4. After students can build accurately, use Beat the Timer for repetition, confidence, and speed.
5. Use Assessment only when students are ready to demonstrate the complete build independently.

Assessment Mode

Before students begin: Tell students that Assessment Mode is an independent attempt and that Check Circuit feedback is not available before submission.

Fresh-start safeguard: Switching into Assessment from Practice, Full X-Ray Circuit, or Beat the Timer clears the existing circuit so a completed build cannot be carried into the assessment.

Scoring: The assessment totals 100 points: Component Selection & Completeness (20 points), Exact Circuit Wiring (75 points), and Fully Operational Circuit (5 points).

Submission: Students enter their first and last name and select Submit for Grade. The results screen provides the overall score plus category-level results and deductions. Have students show or capture the results according to your course procedure.

Instructor Tips

- Do not use Beat the Timer as the first exposure to the circuit; it is most useful after conceptual understanding is established.
- Ask students to explain why each component belongs where it does, not only where to place it.
- During guided practice, let Check Circuit do the first round of troubleshooting and ask the student to interpret the feedback.
- Use Replay X-Ray Production after a correct full circuit to connect circuit operation with filament heating, electron flow, and x-ray production.
- Saved circuits are stored in the browser. For graded work, use Assessment Mode rather than relying on a previously saved circuit.
- Before a graded session, test the activity in the same browser/D2L environment students will use.

Quick Troubleshooting

Issue	What to Try
Student cannot connect components	Select Wire mode, then click one orange port and a second orange port.
Circuit will not validate	Use Check Circuit in practice/full-circuit modes and work through the feedback one issue at a time.
Student wants to start over	Use Clear All to remove components and wiring; Clear Wires removes only the wiring.
Assessment opens with a circuit already present	This should not occur in the current version. Refresh/reload the current HTML and verify that the updated v2.8 file is being used.
D2L display behaves differently	Test the exact embedded version in D2L; browser and LMS rendering can differ from a local HTML preview.

RadTech Interactive • Learn it. Build it. Understand it.

X-Ray Circuit Builder v2.8 • Created by Alison Beckner, M.Ed., RT(R) with AI-assisted development • © 2026