

LED Quiz Boards

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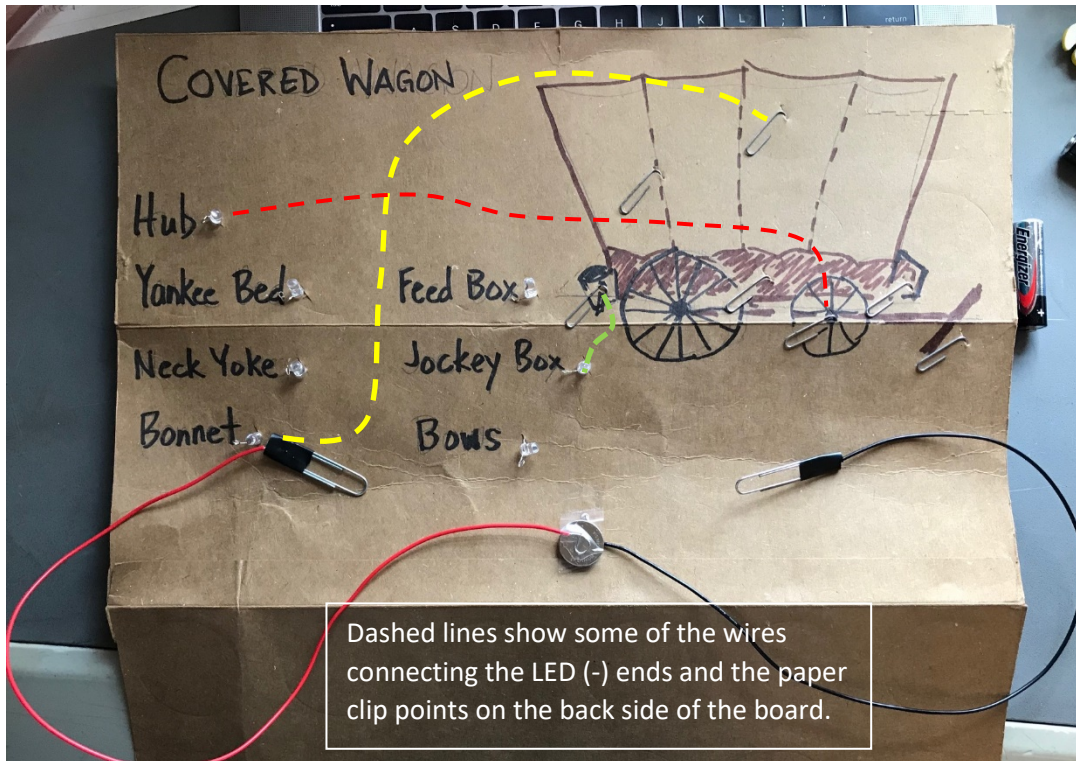
Specialized tools/technology used:	Experience level required:
LEDs, wire stripper/ cutter	beginner

Grade Level (of this example): 3rd-7th

Topic/Content Standards (for this example): US History

Summary of Project:

Students create electronic quizzes and matching games using LEDs, wires, a 3V battery, and craft materials. In this example, students draw fundamental items in a history of technology unit and identify significant parts. They set up matching or multiple-choice questions, or a diagram with labels to match, then wire it so the LEDs will light for correct answers.



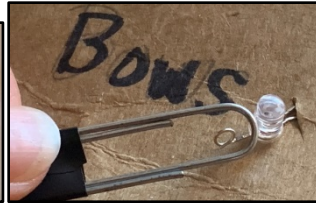
This project was done **without soldering**. LEDs and paper clips were pushed through the cardboard and have one end on either side. Electrical connections on the back side of the board were made by twisting wires onto the (-) ends of the LEDs and onto standard paper clips at the feature locations. See diagrams below.



A) Curling LED wires



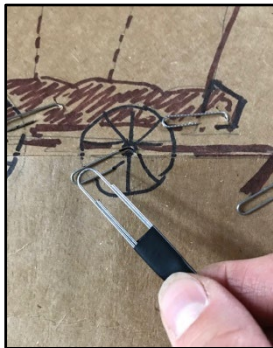
B) LED ready to install



C) LED on front



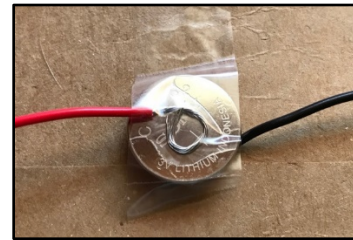
D) LED on back of board



E) Paper clip on front, at highlighted feature



F) Paper clip on back with wire that connects to the LED (-) end



G) Wires connected to 3V battery with tape

A variety of materials may be used for the board and the wiring.

The board can be made out of cardboard, foam-core, corrugated plastic, a box lid, etc.

Wiring is best done with solid or stranded hookup wire (22 or 24 AWG), but can also be done with copper tape (with conductive adhesive), aluminum foil, or possibly a conductive-paint marker. This sample used wire, as many of the connections crossed one another and would otherwise short-circuit the project. Use tape or hot glue to strengthen the connections and keep them from being pulled apart.

When the students finish their projects, the class will have a set of learning tools to share among themselves or with other classes, and even with parents or students in lower grades.

As connections do not require soldering, this project can be safely worked by younger students. Time to completion will depend on complexity of quiz (how many answers to be wired) and age of student. This project can be individual or in small groups.

Possible Content Extensions

ELA

- Grammar – students match vocabulary words to their parts of speech

History

- US government – students match officials (mayor, governor, Secretary of Commerce) with their level of government – city, state, national.

Math

- Venn diagrams – students create a list of items that fit within two or more sets (“yellow things”, “flowers”, “yellow flowers”) designated by circles and the union of the sets. The regions are labelled, and students need to match the item with its correct place in the diagram.