

Light-Up Flags - History Quiz

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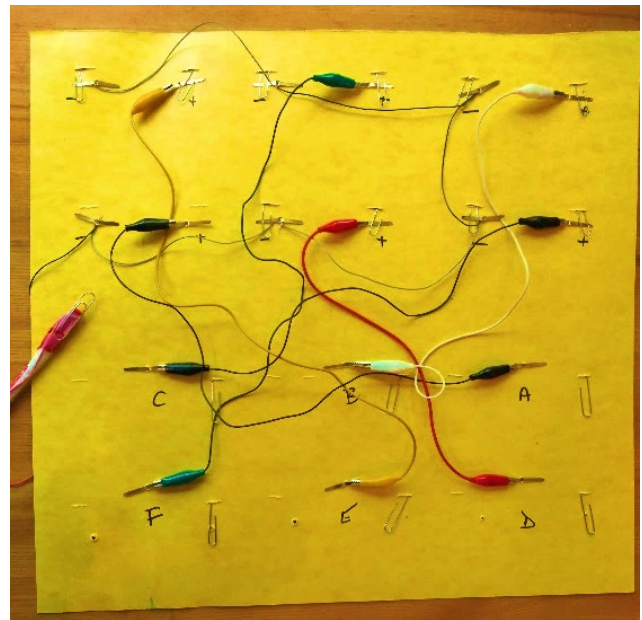
Specialized tools/technology used:	Experience level required:
Standard LEDs, needle-nose pliers Conductive thread, needles, felt, Craft materials	Beginner / intermediate

Grade Level (for this example): 9th grade. Applicable to grades 4 and up with support

Topic/Content Standards (for this example): World History – recognizing national symbols (flags), analysis of historical events.



Front



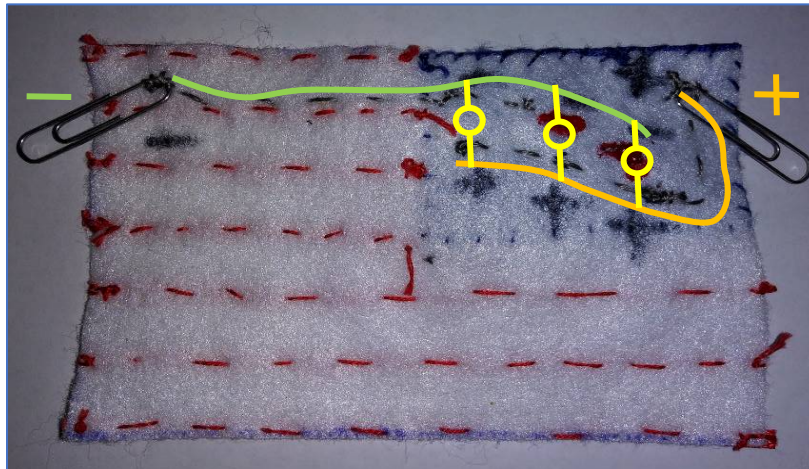
Back

Students use textiles and simple electric components to create a light-up quiz board about an event in history. This example shows the flags of the countries that signed the Treaty of Versailles, and index cards with relevant facts about the countries. The flags are hand-sewn from felt/fabric, and include LEDs that are attached with conductive thread. They attach to a mounting board with paper clips that also serve as electrical contacts. The quiz board can be used many ways – matching, adding facts, rearranging misplaced fact cards, etc.

The flags are made of felt and simple fabrics. Ribbons were a good way to get shiny colorful fabrics in small quantities. Students staple the pieces in place then sew or glue them as appropriate. Embroidery thread can be used for fine features, and the stitches themselves can be part of the flag design.



The LEDs are attached mechanically and electrically by coiling the leads and sewing them down with conductive thread. Each flag needs one (+) and one (-) contact that will connect to the battery. These contacts (below) are paper clips (unpainted and uncoated, just metal) that hang off the back and are spaced 4" apart; they will make both the mechanical and electrical connections to the mounting board. The LEDs on the flags are connected in parallel, so they all connect one end to the (+) contact and the other to the (-) contact. Flags can have up to 5 LEDs, just make sure the (+) and (-) threads do not touch.



Note: LED colors are important because of the voltage they need to turn on. Yellow and red LEDs will work together, and blue, green, and white will work together. One way to use colors that don't work together well is to use all white LEDs and color them with sharpie markers.

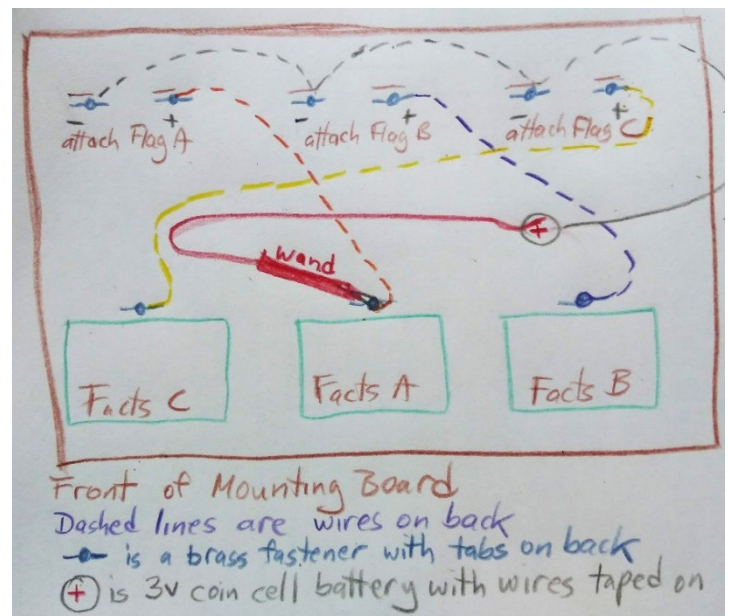
The mounting board is where the connections are made between the LED-studded flags and a 3V battery.

To complete the circuit and light up a flag, the students need to wire up most of the circuit on the back of the mounting board.

The (-) ends of all the flag circuits are connected to the (-) end of the battery.

The (+) end of each flag circuit goes to a brass fastener next to a fact card via an alligator clip on the back of the board.

3V power from the battery comes through a simple wand with a conductive tip (paper clip on a pen). Touch the wand to a brass fastener and the corresponding flag lights up. The students set up the circuits appropriately behind the board.



Possible Content Extensions

- **Social Studies:** Historic/meaningful events, Geography, State Capitals
- **Science:** Ecosystems, Natural resources, Biological classification
- **ELA:** Themes, writing styles, poetry