

## The Interface:

### Computational Making with Scratch and Craft Materials



- 1) Make a computer animation with Scratch.
- 2) Make a picture or collage with paper, markers, tape, and glue.

Important! These aren't step-by-step instructions, but a guide for a journey of exploration. In fact, "one" and "two" above can be done in any order, or in no order at all.

- 3) Connect your animation and your picture with simple conductive materials and a micro-controller.

Your interactive story (or story element) begins with a connection between several things that aren't the same: computer coding; drawing, painting, and collaging; and a simple electric circuit with a paper switch. Together they make a system of improbable delights ... and magic.

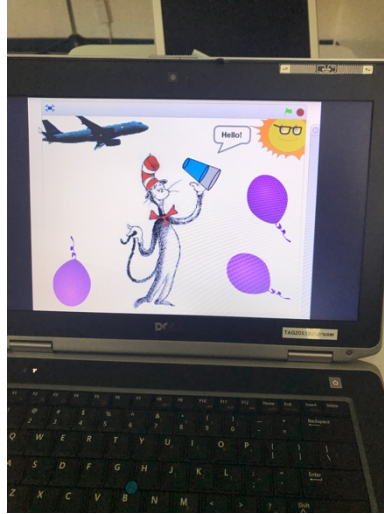
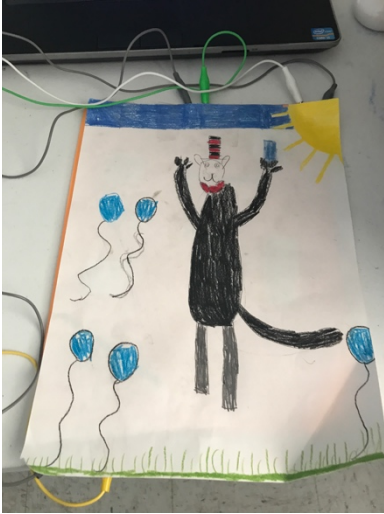
Note: As you build your interface, focus on emotional connections between story elements such as character, setting, and plot. How might you express a moment of transition between these elements – in color, motion, or sound? For instance, what is the color of hope? What is the shape of surprise? What is the sound of expectation?

Attach your picture or collage to your Scratch program with a micro controller like Funkey Simple, Makey Makey, micro:bit, or a hacked computer mouse. Build your switch with conductive materials like copper tape or metallic thread.

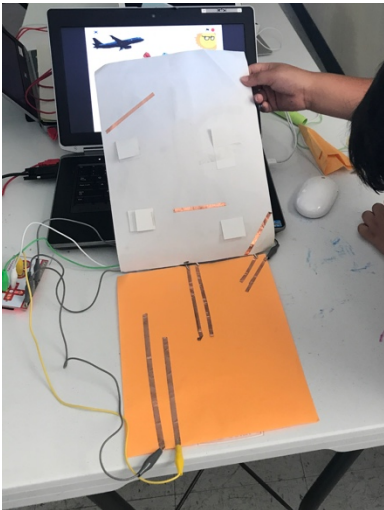
**Key to the process:** Design and build at the same time. Do not "finish" your picture or collage before coding your animation or making your circuit switch.

Some examples from a recent 3rd grade summer camp:

Decide on elements and transitions:

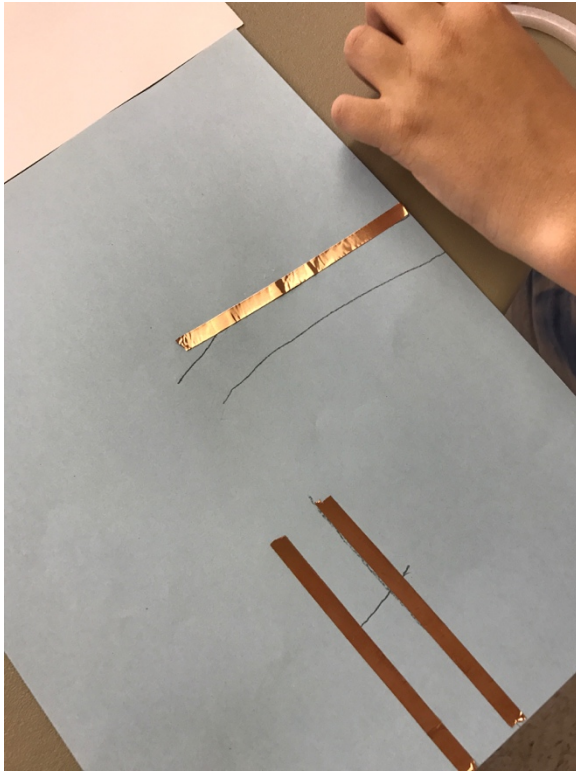


Build the interface with those transitions in mind:



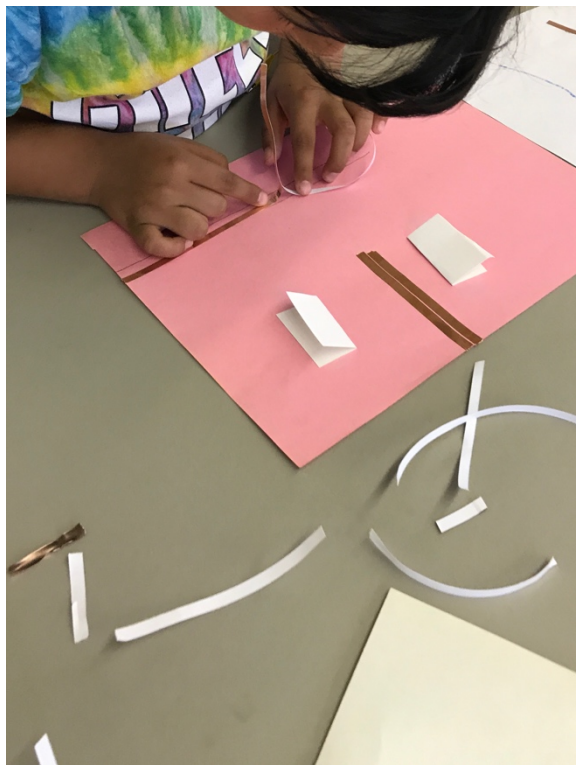
In Scratch, use an interaction block (from the Events menu) to connect your circuit with the animation behavior you want to see.

For example, what will happen in the Scratch animation when a particular spot in the picture is touched? Build hot spots (aka: switches) that activate Scratch in a way that suggests a story element transition. When that spot in the picture is touched, the circuit closes, and the animation/transition begins.

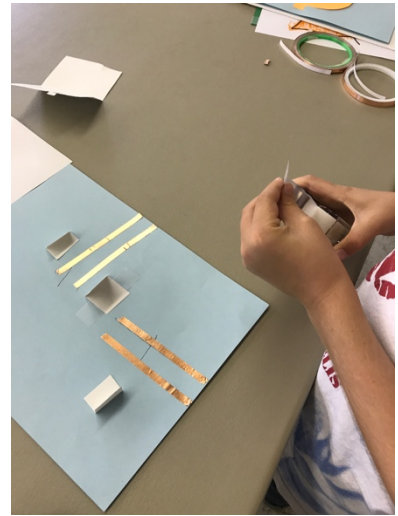
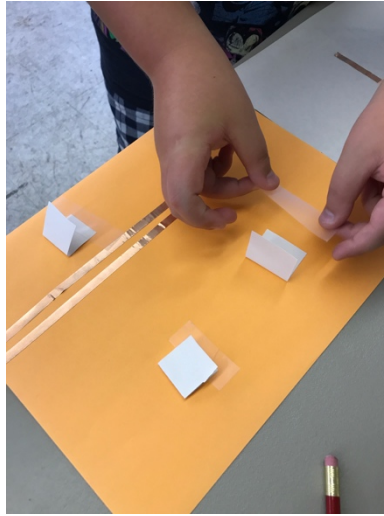
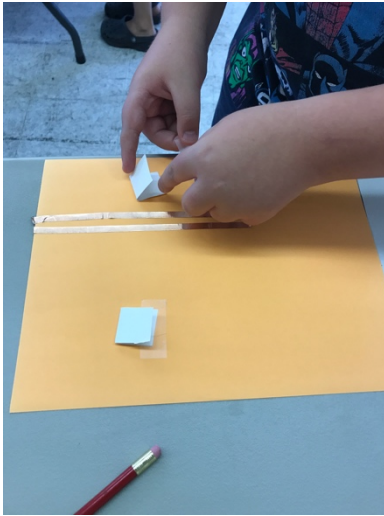


Draw lines where you'll place the conductive copper tape.

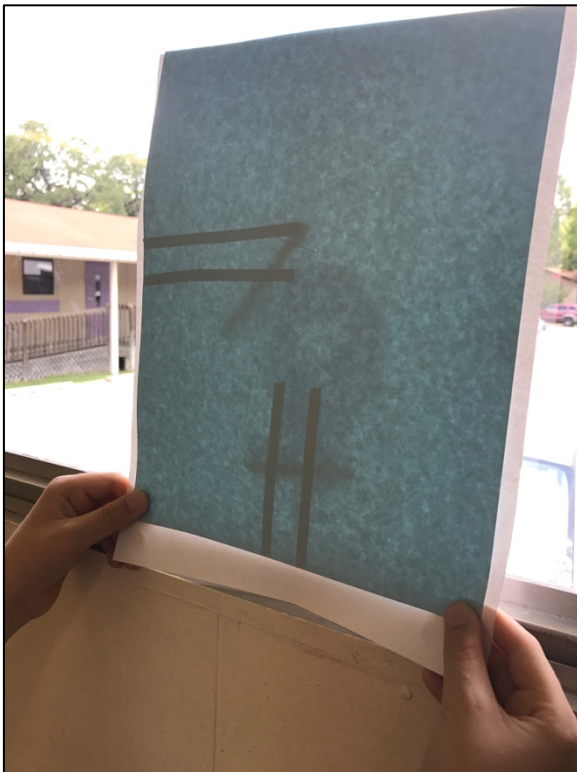
For each switch you'll need parallel 'rails' on the backing page, and then another individual piece of conductive tape on the picture itself. When the picture is pressed, that singular strip of tape bridges the parallels and closes the switch, activating the Scratch animation.



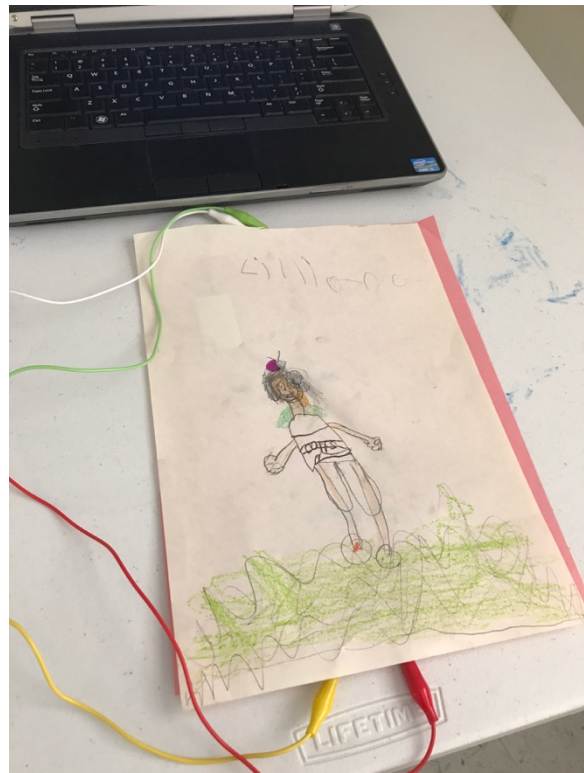
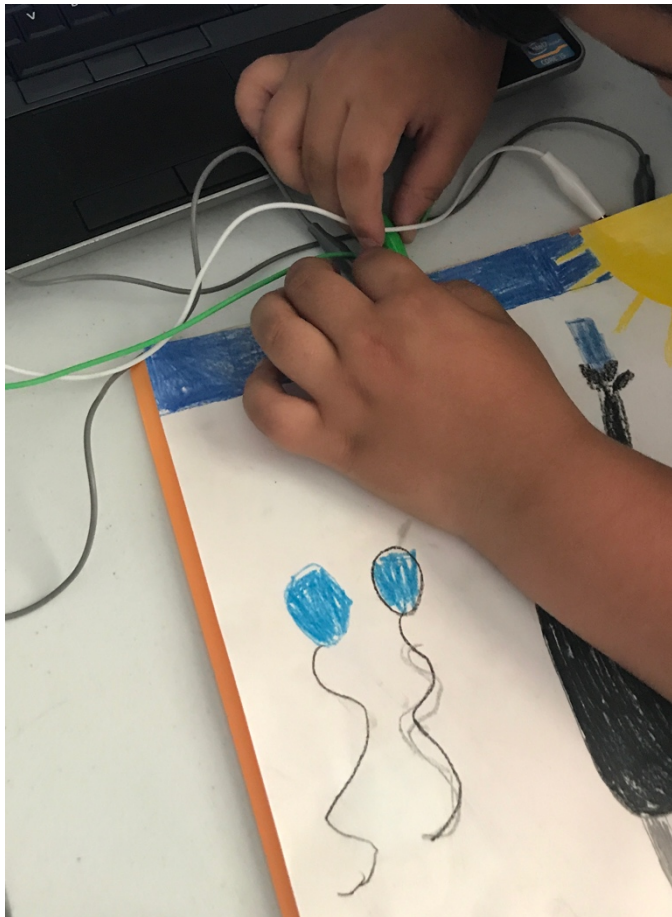
Be careful to keep the 'rails' parallel. If the conductive tapes touch, the switch will be permanently 'on' (i.e., a short circuit), and the Scratch program will be constantly animated.



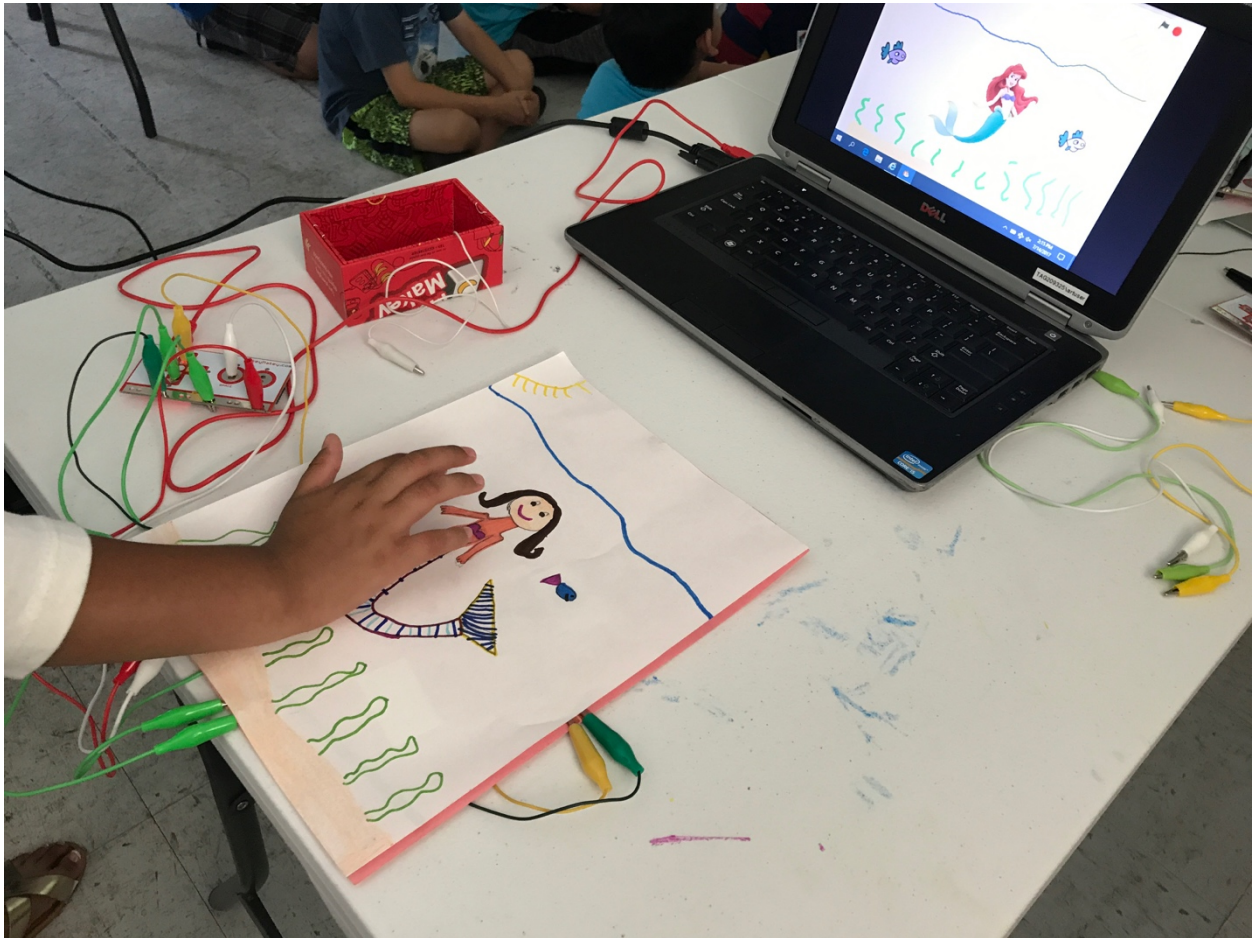
Make small hinges from index cards to prevent the copper tape from touching all the time. You only want the 'rails' to connect when you touch the picture.



Use a window (or other light source) to be sure that the 'switch' (the singular piece of tape) is going to cross/connect the parallel rails. If it doesn't connect, the circuit won't close ... and your animation won't be activated.



Test as you build. Change what doesn't work. Rearrange the switch, the rails, the hinges, and just keep going.



And finally, share with your friends!

Example on Scratch:

Interface Cat <https://scratch.mit.edu/projects/170867753/>

See more examples:

FLT Studio One <https://scratch.mit.edu/studios/5089513/>

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