



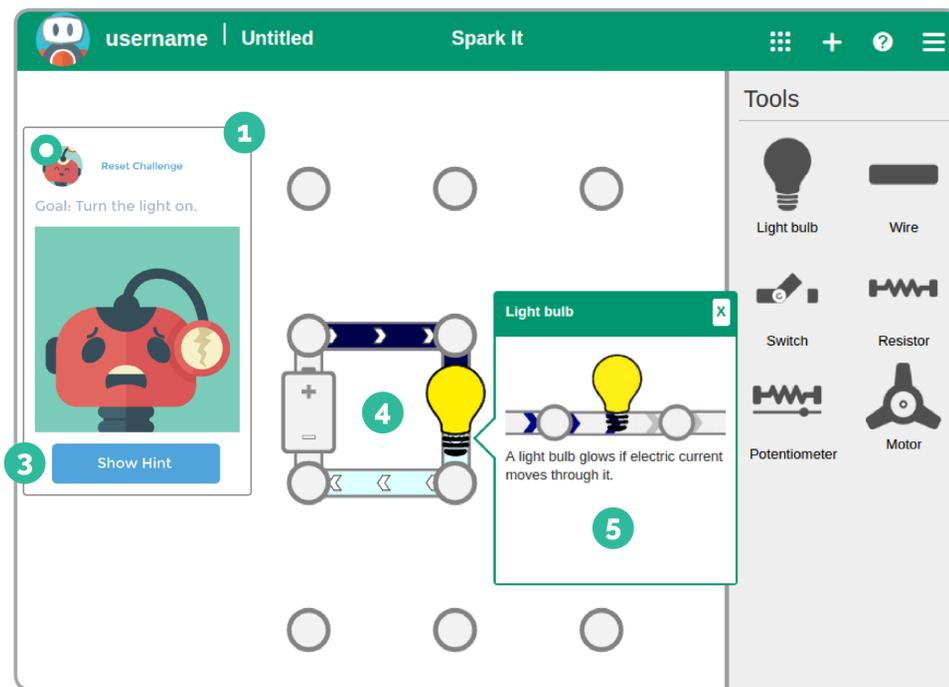
## AN APP FOR KIDS TO BUILD AND EXPLORE CIRCUITS



### PROJECT DESCRIPTION

Circuits can be difficult to understand because **electric current is invisible to the human eye**. Spark It is a new addition to SOLIDWORKS Apps for Kids, an ecosystem of web applications where young thinkers are free to create and express their ideas. Our team's app allows kids to see the underlying physics behind circuits in their everyday lives.

### INTERACTING WITH THE APP



- 1 GOAL** Complete challenges to progress through the learning activities.
- 2 SIDEBAR** Select components and place them on the canvas to construct a circuit.
- 3 HINTS** Request help on the current challenge, when stuck.
- 4 COMPONENT** Delete or replace components when they are placed.
- 5 POPUP** Gain knowledge about each component when it is placed.

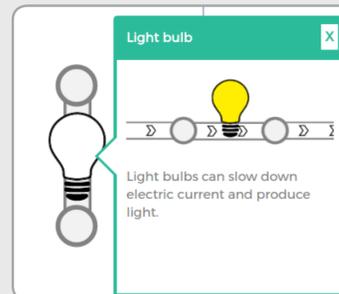
### CRAFTING THE LEARNING ENVIRONMENT

We designed Spark It to challenge and motivate kids to learn about circuits.



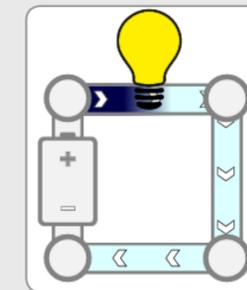
#### PROVIDING A PURPOSE

From user research, we learned that kids enjoyed working towards tangible goals. In our app, they can create circuits to help robots living in a fictional world. The story helps provide an overarching purpose for kids to build electrical devices, such as flashlights and voltage dividers.



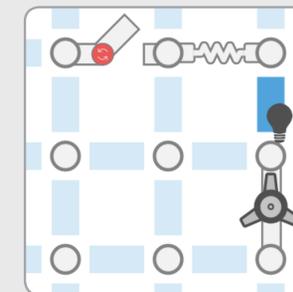
#### TEACHING SPECIFIC CONCEPTS

Popups teach the fundamental physics behind each electrical component. Analogies between electric current and water help introduce concepts about electricity. The wording is carefully written so that kids do not form misconceptions.



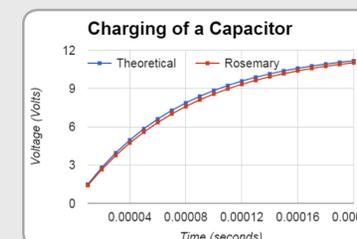
#### VISUALIZING CIRCUITS

Animations provide a window into the invisible world of circuitry. These help to build an intuition for non-intuitive concepts. Arrows along the components show the direction and magnitude of electric current, and the colors indicate voltage.



#### ENABLING CREATIVITY

Kids have the freedom to mix and match electrical components. They can easily test different circuit configurations to see how electric current flows through their systems.



#### SIMULATING THE REAL WORLD

The app is more than just a toy. We built a circuit simulation engine that accurately calculates the current and voltage values for any given arrangement of components.

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