GLOW ROPE 2.0

ABSTRACT

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- **What is your project about?**

Glow Rope 2.0 is addressing the current issues with commercial light up jump ropes by designing and constructing a light up jump rope to use when doing jump rope performances in the dark. My jump rope team the Tucson Twist-It's and other teams around the world do not currently have highly functional light up jump ropes.

- **Why did you choose this project?**

My jump rope team, along with many others, struggles to find light up jump ropes that are easy to jump with and that light up without issues. Most light up jump ropes are very stiff, don't light up properly, and are way too heavy or way too light. I wanted to solve this problem and build a light up jump rope that my team could use and enjoy jumping with!

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ABSTRACT CONTINUED

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- **What was your result/overall conclusion?**

Both ropes that I made were usable, but overall the Variety Rope received the highest scores. The lighting looked incredible when the rope was turning. Although it was heavy, it was not too heavy to turn. The Multicolored Rope was too light and because I used a strip of fairy lights, the lighting was patchy.

- **Why is your project important to others, the world, a specific group?**

When we do jump rope shows in our community we want people to enjoy the show. If someone created a lightweight rope, with good lighting, it would benefit the entire jump rope community both in the United States and in other countries where jump rope is popular. With better ropes, more people might decide to jump, leading to greater popularity and support for the sport.

INTRODUCTION ~ BACKGROUND

- Most Light up jump ropes are difficult to jump with because of their poor light up abilities. They often light up only halfway, or the lights are very patchy.

- Rechargeable battery packs are very common in store bought light up jump ropes because they provide a long lasting charge to keep the rope going. Unfortunately, the battery packs are heavy.

- Handles on a light up jump rope are commonly made of plastic and are attached securely on the end, and sometimes the battery pack is stored inside of the handle to help balance the rope.

- Light up jump ropes are usually not made with real poly-cord rope. They are often made with plastic tubing or plastic rope because it provides more durability and it distributes the lights better around the rope.

PROBLEM

Is it possible to build a light up jump rope that is a good weight, has light up capabilities, and stays lit up?

When my jump rope team has night shows, light up ropes look incredible and provide an added element of fun for the audience. However, the current light up jump ropes available for purchase are very difficult to use. Often the ropes get twisted, only half of the rope actually lights up, and the ropes are way to heavy to turn. Given these constraints, is it possible to build a rope that can light up effectively and turn easily?

CRITERIA AND CONSTRAINTS

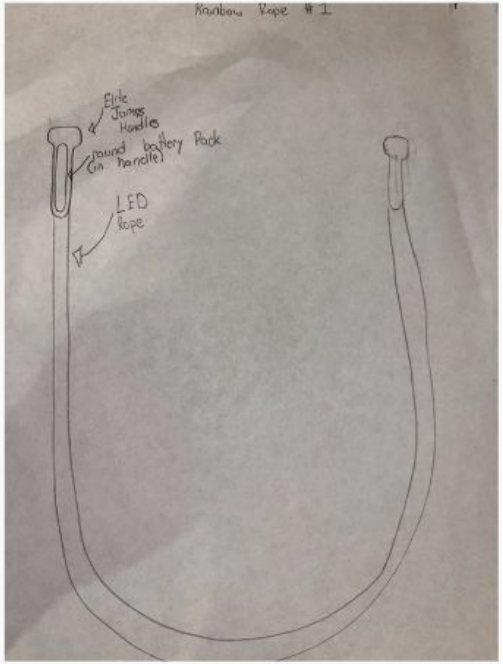
Criteria: The LED jump ropes I made were tested by my jump rope team. I used a one star to five star ranking system in four different categories: light up ability, performance ability, ease of use, and overall use.

Constraints: I had minimal time to research, build, and test this project because my jump rope team was training for a big competition. I had to wait for a practice where we had time to test the ropes which also pushed my project back by a couple of weeks.

Constraints: I wanted to keep the cost for this project under $100 to keep it affordable. This included buying supplies for both ropes. I also wanted to keep the design as simple as possible because I don't have much building experience. The jump rope community also has a large age and experience range and I wanted rope construction to be easy enough for jumpers to make at home, no matter their age or experience.

DESIGN AND METHODOLOGY

The Variety Rope that I built was an LED rope strip and I used a portable battery pack that I had at my house. I hot glued the battery pack to the rope about an inch down from the handle to prevent it from sliding down the rope, and then I zip-tied it to prevent it from falling off. I then attached handles from an old light up jump rope. I pushed the wire into the handle to get it out of the way. Lastly, I sprayed the middle of the rope with clear protectant spray to prevent it from fraying and falling apart.



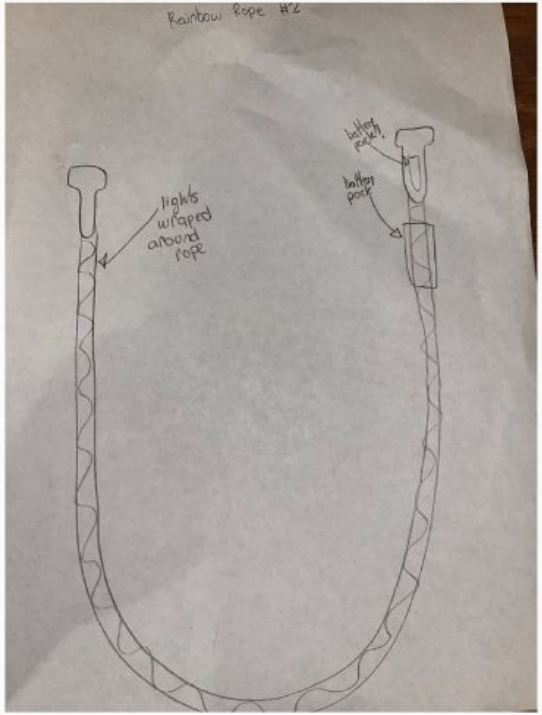
$8.99

$31.99

$8.99

$5.00

DESIGN AND METHODOLOGY



The Multicolored Rope that I built was a piece of poly-cord (rope) that I wound the lights around. I attached handles from an old jump rope and looped the rope around the handle and into the bottom of it. I then attached the battery pack by gluing and zip-tying it to prevent it from slipping off. Lastly, I cut five white beads in half, and inserted the rope through the slit in the beads.

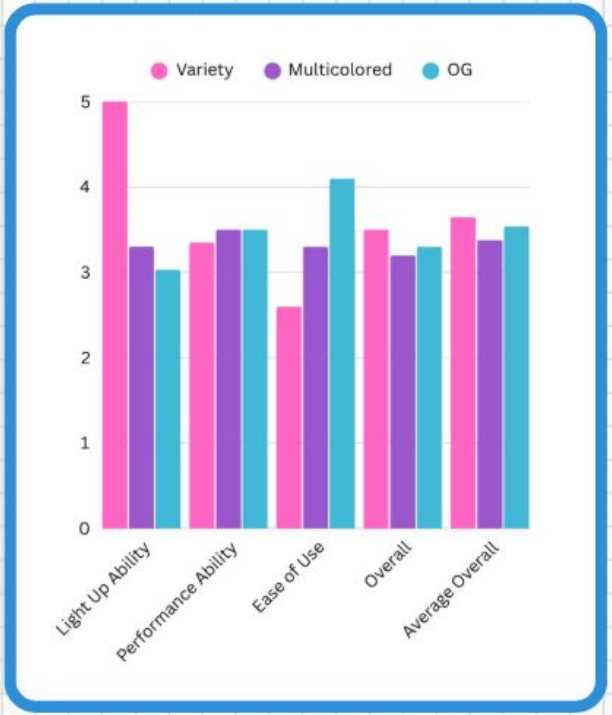
$5.00

$1.50

$9.99

$3.00

EXECUTION: CONSTRUCTION AND TESTING RESULTS



Variety Rope

Multicolored Rope

OG Rope

RESULTS AND DATA VISUALIZATION

Photo taken by student

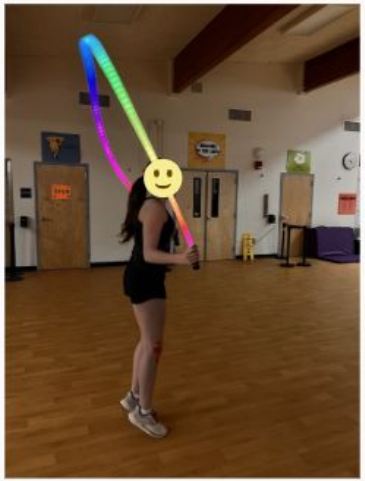


Photo taken by student

Photo taken by student

Photo taken by student

RESULTS AND DATA VISUALIZATION

Multicolored Rope:
Photo taken by student

Variety Rope:
Photo taken by student

Multicolored Rope:
Photo taken by student

Variety Rope:
Photo taken by student

SUMMARY

Summary: Glow rope 2.0 is an engineering project with the goal to create a usable LED jump rope for my jump rope team. Light up jump ropes provide an amazing show for the audience, but are very difficult for us to jump with because they are too heavy or light, don't have good light up capabilities, or get twisted very easily. I built two light up jump ropes in two very different ways and tested them alongside our old light up jump rope. The first one was built with a pre-bought LED rope, but the other was built using a string of fairy lights that I wrapped around a piece of rope. I also used 2 different types of protection, jump rope beads and protective spray which is different from the usual clear plastic tube used on most light up jump ropes. When I tested the ropes I had my jump rope team (The Tucson Twist-Its) and a jumper from Colorado Claim Jumpers test it which was very interesting because although the results were similar, there were differences in the weight because each team is different.

IMPLICATIONS FOR FUTURE RESEARCH

Comparison: There are many major differences between Glow rope 2.0 and LED Us Jump, my first light up jump rope project. Firstly, I used a completely different strategy to build the ropes by buying pre-made LED strips for the variety rope. Secondly, in Glow rope 2.0 I tested the 2 ropes I made in addition to the original rope we use, whereas in LED Us Jump I just tested the 2 ropes I built. Lastly, the ropes I built for Glow Rope 2.0 were much more balanced and strong than LED Us Jump because I focused on making them more equal. I also collected more feedback and comments in Glow Rope 2.0 which provided a much more interesting data collection when creating the graphs.

Future: If I did anything with this in the future I would try to make a set of double dutch ropes because it could be used with a whole group of people instead of just one person with a single rope. I would also try to get some jumpers from other teams to try it.

REFERENCES

“Light Show LED Jump Rope.” Elite Jumps. Elite Jumps, 2026, https://elitejumps.co/products/light-show-jump-rope?variant=41251049472094. Accessed 3 September 2025.

“LED Light Up Jump Rope for Kids and Adult.” Amazon. ACHDOFITS, 2026, URL. Accessed 3 September 2025.

“9' Multicolor LED Jump Rope.” Glow Source. Glow Source, 2026, https://glowsource.com/holidays/9-multicolor-led-jump-rope/?srsltid=AfmBOoqiLH5kz3E3AEB2D8Ssb8ffS3f_8_SfKnJZFCPQlkTLJptSKGIT4fU. Accessed 3 September 2025.