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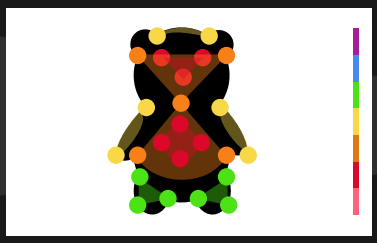
LiDAR Patch

Using lasers to draw maps



What is LiDAR?

LiDAR, which stands for Light Detection and Ranging, is a way to create an elevation map by using a satellite. Light, in the form of a laser beam, bounces off the surface of whatever is below and returns to a receiver on the satellite. Based on how long it takes to bounce back up, the receiver can tell the height of the objects or the ground below: hills, mountains, rivers; even houses and trees!

How do scientists use it?

Scientists use LiDAR to create topographical maps, meaning a type of map that shows the elevation of different areas. They use this to map different parts of the Earth's surface, like forests or cities. Some types of lidar can see through water, which allows scientists to map the ocean floor!

Scientists also use LiDAR in outer space, to create maps of other planets and moons.

Materials Needed

- A shoebox
- Two pieces of blank printer paper
- Tape
- A bamboo skewer
- A ruler
- A pack of markers with red, orange, yellow, green, blue, purple, and pink
- Object(s) to map: this can be a teddy bear, random objects from around the house, or you can build your own landscape using something like Play Doh

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The Activity

In this activity, we are going to pretend that the inside of the box is a mysterious landscape that you as the scientist want to map. Using a colored bamboo skewer as our lidar beam, we are going to create a topographical map of whatever is inside the box.

1. Set Up/Prepare Your Materials

a. Put your object(s) in the box, and tape a piece of paper over the top so it covers it completely. Prepare a scratch paper on the side to record your findings.

b. Prepare your bamboo skewer: this is going to be your Lidar light beam. Using your ruler, mark off sections every 2cm, starting XXX cm up. Color each section in, in rainbow order. You should end up with 7 sections.

2. Get Poking!

With your colorful stick, poke a hole in the paper until the stick stops. Look at what color it reaches on the stick, and make a dot with the same color on your scratch paper. Make sure to make the dot on the scratch paper in the same place you poked the hole in the box.

3. Fill the paper

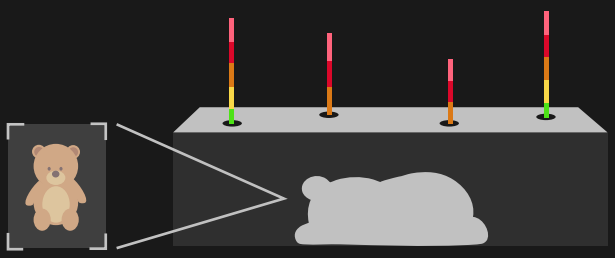
Repeat step 3 all around the box, until you have lots of colorful dots on your scratch paper.

4. Color it in

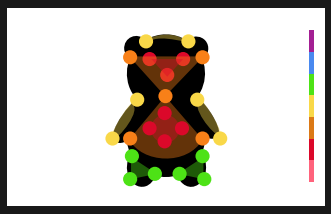
It's time to make the map! Connect all of the dots of the same color that are near each other, and color that section in. Keep going until you have colored in your entire map.

5. Enjoy your map!

You did it – you mapped the inside of the box using the same technique NASA scientists use to analyze LiDAR data!



Mystery Box



Scratch Paper

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